Vol. 1042 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

May 8, 1984

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

May 8, 1984 Volume 1042 Number 2

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1042 OG 16
Reissue Applications Filed	1042 OG 16
Requests for Reexaminations Filed	1042 OG 16
Removal from Register	1042 OG 16
Filing of Patent Applications Pursuant to 37 CFR 1.60	1042 OG 18
Patent Suits	1042 OG 18
Proposed Rules for Patent Maintenance Fees	1042 OG 22
Patent Certificates of Correction	1042 OG 39
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1042 OG 40
Condition of Patent Applications	1042 OG 41
Reissue Patents Granted (31,581)	463
Plant Patents Granted (5,228)	465
Patents Granted	
General and Mechanical (4,446,571)	467
Chemical (4,447,241)	701
Electrical (4,447,670)	813
Design Patents Granted (273,719)	895
Index of Patentees	PI 1
Indices of Reissue, Design and Plant Patentees	PI 49
Classification of	
Patents (Including Reissues)	PI 53
Designs and Plants	PI 56
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 57
Designs and Plants	PI 58
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced at 1037 O.G. 12 on Dec. 13, 1983. The search fee for the European Patent Office was changed as of Feb. 14, 1984 and was announced at 1039 O.G. 142 on Feb. 21, 1984.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Prior corresponding U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International Fees	
Basic fee (first 30 pages)	295.00
Basic Supplemental fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Jan. 30, 1984. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,330,357, Re. S.N. 586,209 Filed Mar. 5, 1984, Cl. 156/584, DISPENSER FOR LINER-WOUND TAPE, Philip W. Collins, Owner of Record: *Minnesota Mining and Manufacturing Co., St. Paul Minn.* Attorney or Agent: Donald M. Sell, et al., Ex. Gp.: 161

4,335,838, Re. S.N. 587,343, Filed Mar. 8, 1984, Cl. 223/91, SKIRT AND TROUSER CLIP FOR HANGER, Leonard Bisk, et al., Owner of Record: *Independent Products Co., Inc., Lansdale, Pa.* Attorney or Agent: A.D. Caesar, Ex. Gp.: 353

4,355,372, Re. S.N. 587,315, Filed Mar. 7, 1984, Cl. 364/900, MARKET SURVEY DATA COLLECTION METHOD, Tod Johnson, et al., Owner of Record: *NPD Research, Inc., Floral Park, N.Y.,* Attorney or Agent: Lawrence G. Kurland, Ex. Gp.: 237

4,369,768, Re. S.N. 577,673, Filed Feb. 7, 1984, Cl. 128/6, ARTHROSCOPE, Marko Vukovic, Owner of Record: *Inventor,* Attorney or Agent: Sidney Wallenstein, et al., Ex. Gp.: 335

4,389,598, Re. S.N. 588,914, Filed Mar. 12, 1984, Cl. 315/291, DISCO LIGHT ASSEMBLY, Robert M. Smith, Owner of Record: *Inventor,* Attorney or Agent: Keith D. Beecher, Ex. Gp.: 251

4,412,621, Re. S.N. 589,483, Filed Mar, 14, 1984, Cl. 211/58, MAGAZINE ASSEMBLY FOR HOLDING INFORMATION BEARING CARDS AND THE LIKE, Falk-Jungen Eichner, Owner of Record: *Fellows Manufacturing Co., Itasco, Ill.,* Attorney or Agent: Talivaldis Cepuritis, et al., Ex. Gp.: 355

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue

Removal from Register

Pursuant to the provisions of 37 C.F.R. 1.347, a letter was directed on Nov. 18, 1983, to the last post office address furnished to the Office of Enrollment and Discipline[Committee on Enrollment] by each of the persons whose name and address appear on the following list. With respect to some of the letters, no reply was received within the period of forty-five (45) days therein set. Other letters were returned by the Post Office with notations to the effect that the addressee was deceased, unknown, or had moved and left no forwarding address.

Accordingly, the names of the following persons have been removed from the Register of Patent Attorneys and Patent Agents.

WILLIAM FELDMAN,
Apr. 11, 1984. *Director, Office of Enrollment and Discipline.*

Joseph F. Padlon, 27 Broadview Ave., Bellport, N.Y., 11713

Alfred E. Page, 131 Neperan Rd., Tarrytown, N.Y., 10591

Robert Thomas Palmer, Sr., 15 Pleasant St., Sharon, Mass., 02067

Chris Papageorge, Jacoby & Meyers, 2285 Westwood Blvd., Los Angeles, Calif., 90064

Boris Parad, Pullman, Inc., Pat. Law Section, 200 S. Mich. Ave., Chicago, Ill., 60604

Albert M. Parker, American Flange & Mfg. Co., Inc., 1100 W. Blancke St., Linden, N.J., 07036

N. Douglas Parker, Jr., Scrivener, Parker, Scrivener & Clarke, 1030 15th St., N.W., Washington D.C., 20005

Ralph Elliott Parker, Burns, Doane, Swecker & Mathis, Geo. Mason Bldg., Wash. & Prince Sts., Alexandria, Va., 22313

Robert L. Parker, Christie, Parker and Hale, Union Bank Plz., 201 South Lake Ave. Pasadena, Calif. 91101

Walter J. Parker, 1059 Lake Ave., Apt. 66, Rochester, N.Y. 14613

George L. Parkhurst, 150 Val De Flores Dr., Burlingame, Calif., 94010

Roy L. Parsell, 609 Summer Hill Rd., Madison, Conn. 06443

Adriano Pasqualetti, Montedison S.P.A., Pat. & Lic. Dept., Largo Donegani, 1/2, Milano, Italy
Rowland Vermilye Patrick, Fish & Richardson, Suite 2100, 28 State St., Boston, Mass., 02109
Robert Ellsworth Patridge, E.I. Du Pont De Nemours and Co., 1007 Market St., Wilmington, Del., 19898
James H. Patterson, Schmidt, Johnson, Hovey & Williams, 1400 Mercantile Bank Tower, 1101 Walnut, Kansas City, Mo., 64106
Donald E. Payne, P.O. Box 957, Kamuela, Hi., 96743
Frank A. Peacock, P.O. Box 896, Carrollton, Ga., 30117
Edwin C. Pearson, 373 W. Mountain Rd., Ridgefield, Conn., 06877
Hilary E. Pearson, Rosenblum, Rabkin, Parish, Jack Bachli & Bacigalupi, P.C., 114 Sansome St., San Francisco, Calif., 94104
Victor A. Peckham, Brown, Murray, Flick and Peckman, 800 Benedum - Trees Bldg., 221-223 4th Ave., Pittsburgh, Pa. 15222
Anthony Pellicano, 4075 Jones Ave., Riverside, Calif., 92505
Veo Peoples, Jr., Ralston Purina Co., 835 Checkerboard Sq., 9th Floor, Tower Bldg., St. Louis, Mo. 63188
Ben Harrison Perkins, 9 Donsen Ln., Scotch Plains, N.J., 07076
Howard M. Peters, Hexcel Corp., Legal Dept.-Suite 1400, 650 Calif. St., San Francisco, Calif., 94108
John Donald Peterson, 12 King St., Onancock, Va., 23417
William S. Pettigrew, 10353 Prairie Hills Cir., Sun City, Ariz., 85351
David W. Pettis, Jr., Duckworth, Hobby, Allen and Pettis, P.A., 403 E. Kennedy Blvd., P.O. Box 1528, Tampa, Fla., 33601
James F. Phelan, Uniroyal, Inc., Spencer St., Naugatuck, Conn., 06770
Lewis H. Phelps, Jr., 56 Bramble Ln., Riverside, Conn., 06878
Donald James Piggott, Kearney & Trecker Corp., 11000 Theodore Trecker Way, Milwaukee, Wis., 53214
Maurice L. Pinel, 453 Gregory Ave., Weehawken, N.J., 07087
Paul C. Pink, 2449 Dale Ave., Columbus, Ohio, 43209
William Frank Pinsak, American Motors Corp. 27777 Franklin Rd., Southfield, Mich., 48076
Vincent P. Pirri, Eutectic Corp. 40-40 172nd St., Flushing, N.Y., 11358
Angelo M. Pisarra, 34 W. Lincoln St., Verona, N.J., 07044
David M. Pitcher, Finnegan, Henderson, Farabow & Garrett, 1775 K St., N.W., Washington, D.C., 20006
Leo A. Plum, Union Carbide Corp., 270 Park Ave., New York N.Y., 10017
Willard L.G. Pollard, The Firestone Tire and Rubber Co., 1200 Firestone Pkwy., Akron, Ohio, 44317
Michael J. Pollock, Envirotech Corp., 3000 Sand Hill Rd., Menlo Park, Calif., 94025
George J. Porter, 2007 Gallatin St., Suite C, Huntsville, Ala., 35801
George W. Porter, Rm. 335 District Bldg., 14th & E St., N.W., Washington, D.C., 20004
Met R. Poston, Akzona, Inc., P.O. Box 2930, Asheville, N.C., 28802
John Wilmer Poteet, Jr., 1210 Witaker Mill Rd., Joppa, Md., 21085
Dwight J. Potter, American Home Products Corp., 685 Third Ave., New York, N.Y., 10017
Newell Pottorf, 3832 S. Victor Ave., Tulsa, Okla., 74105
Frank B. Powell, Cohn, Powell & Hind, P.C. 7700 Clayton Rd., St. Louis, Mo., 63117
John R. Powell, Cornelius, Powell & Perkins, 391 Landa St., New Braunfels, Tex., 78130
Marvin J. Powell, Phillips Petroleum Co., 405 TRW Bldg., 4th & Dewey, Bartlesville, Okla., 74004
Bradford R. L. Price, Lee & Smith, Suite 330, 10 S. Riverside Plz., Chicago, Ill., 60606
Janet Errington Price, C P C International, Inc., International Plz., Englewood Cliffs, N.J., 07632
Charles Andrew Prudell, 1625 Greenway Terr., Elm Grove, Wis., 53122
Jack D. Puffer, The Garrett Corp., 9851-9951 Sepulveda Blvd. P.O. Box 92248, Los Angeles, Calif., 90009
Robert E. Pulfrey, Ziegler, Caldwell & Pulfrey, 1923 6th Ave. S.E., Aberdeen, S.D., 57401
Theodore V. Quarnstrom, II, 45 Almira Rd., South Yarmouth, Mass., 02664
Charles E. Quarton, 2921 Middlebury, Birmingham, Mich., 48010
Thomas Wallace Quinn, II, 831 Parkes Run La., Villanova, Pa., 19085
Richard P. Radke, Alberi & Radke, Roscoe - Topanga Bldg., 8399 Topanga Canyon Blvd., Canoga Park, Calif., 91304
Harry Radzinsky, 1323 Queens Rd., Charlotte, N.C., 28207
Charles C. Rainey, Sr., U.S. Army Natick Res. & Dev. Comm., Kansas St., Natick, Mass., 01762
Shyamala Rajender, Cetus Corp., Patent Dept., 600 Bancroft Way, Berkeley, Calif., 94710
John C. Randa, Rt. No 1, Box 104, Oostburg, Wis., 53070
Allan Ratner, Ratner & Prestia, 412 Leighton Bldg., 500 N. Gulph Rd., P.O. Box 980, Valley Forge, Pa., 19482
Norman Arnold Rautiola, Nartron Corp., 5000 N. U.S. 131, Reed City, Mich., 49677
Warren E. Ray, 440 Finch Dr., Satellite Beach, Fla., 32937
James R. Reck, 4 Bob White Way, Simsbury, Conn., 06070
James E. Reed, Exxon Co., P.O. Box 2180, Houston, Tex., 77001
Louis F. Reed, Fish & Neave, 277 Park Ave., New York, N.Y., 10017
Chessie E. Rehberg, Route 4, Box 215, Hendersonville, N.C., 28739
James A. Rich, Sybron Corp., Midtown Tower, Ste. 1100, Rochester, N.Y.. 14604
Gloria H. Richard, Lindgren & Zickert, P.C. Suite 800, 79 W. Monroe St., Chicago, Ill., 60603
Jean-Thomas Richard, II, Trust Bldg., 48 Sparks St., Ottawa, Canada
George M. Richards, Warner-Lambert Co., 201 Tabor Rd., Morris Plains, N.J., 07950
Edmunde David Riedl, Merck & Co., Inc., Pat. Dept., 126 E. Lincoln Ave., Rahway, N.J., 07065
Alexander N. Riedy, E.I. Du Pont De Nemours & Co., 1007 Market St., Wilmington Del., 19898
Furman Rinehart, 166 W. High St., Waynesburg, Pa., 15370
Robert Harvey Rines, Rines and Rines, 81 North State St., Concord, N.H., 03301
Andrew O. Riteris, Michael, Best & Friedrich, 250 E. Wisconsin Ave., Milwaukee, Wis., 53202
David Robbins, 5500 Friendship Blvd., Chevy Chase, Md., 20015
Eugene Joseph Roberts, Burns, Doane, Swecker & Mathis, Geo. Mason Bldg., Wash. & Prince Sts., Alexandria, Va., 22313
Kent B. Roberts, Merchant, Gould, Smith, Edell, Welter & Schmidt, Suite 1000, Northwestern Natl. Bk. Bldg., St. Paul, Minn., 55101
Frederick A. Robertson, U.S. Energy Res. & Dev. Admin., P.O. Box 808, Livermore, Calif., 94550
Raymond A. Robic, Robic, Robic & Assoc., 1514 McGregor Ave., Montreal, Que. H3G 1B9, Canada
George N. Robillard, Finnegan, Henderson, Farabow & Garrett, 1775 K St., N.W., Washington D.C., 20006
Arnold Robinson, Box 533, Cutchoque, N.Y., 11935
Walter M. Rodgers, Jr., 1918 Gas Light Tower, 235 Peachtree St., N.E., Atlanta, Ga., 30303
Phil L. Rodier, 152 Douglas Pl., Mount Vernon, N.Y., 10552
Edward Gaynor Roe, Collard, Roe & Malcolm, 1077 Northern Blvd., Roslyn, N.Y., 11576
John J. Rogan, 21 Bourndale Rd., N., Manhasset, N.Y., 11030

Howard H. Rogers, Jr., Gradolph and Rogers, Suite 2042, 230 W. Monroe St., Chicago, Ill., 60606
L. Lawton Rogers, III, Burns, Doane, Swecker and Mathis, Geo. Mason Bldg., Wash. & Prince Sts., Alexandria, Va., 22313
Harvey Mark Rogosin, 8 E. 96th St., Apt. 1D, New York, N.Y., 10028
Benita J. Rohm, Hopgood, Calimafde, Kalil, Blaustein & Judlowe, Lincoln Bldg. 60 E. 42nd St., New York N.Y., 10165
Stanley T. Rolfson, Monsanto Co., P.O. Box 12830, Pensacola, Fla., 32575
John R. Romig, Rd 2 Box 163, Millersburg, Ohio, 44654
Rita M. Rooney, 863 Osage Rd., Pittsburgh, Pa., 15243
Gerald Rose, Leydig, Voit, Osann, Mayer & Holt, Ltd., 1 IBM Plz., Suite 4600, Chicago, Ill., 60611
Leo A. Rosetta, 3504 Fitzhugh La., Silver Spring, Md., 20906
Philip J. Rosewarne, McGinty, Rosewarne & Halverson, P.C., Suite 103, 271 Woodland Pass, East Lansing, Mich., 48823
Charles D. Ross, 131 N. Jefferson St., Dayton, Ohio, 45402
Edmund C. Ross, Jr., 854 Brooklawn, Troy, Mich., 48084
Thomas S. Ross, 21 Milburn Dr., Bloomfield, Conn., 06002
S. Joseph Rotondi, 11403 Orleans Way, Kensington, Md., 20795
Donald A. Rowe, Lamson & Sessions Co., 5000 Tiedman Rd., Cleveland, Ohio, 44144
Charles E. Ruby, 2317 Alta Ave., Louisville, Ky., 40205
S.W. Russell, Suite 405 - Bldg. 1, 2001 Jefferson Davis Hwy., Arlington, Va., 22202
Matthew M. Russo, 550 Old Country Rd., Hicksville, N.Y., 11801
James Wm. Rustad, Johnson Thompson, Klaverkamp & James, P.A., 80 S. 8th St., 4444 IDS Center, Minneapolis, Minn., 55402
Daniel D. Ryan, III, Michael, Best & Friedrich 250 E. Wisconsin Ave., Milwaukee,Wis., 53201
Joseph C. Ryan, GTE Sylvania, Inc., 100 Endicott St., Danvers, Mass., 01923

Filing of Patent Applications Pursuant to 37 CFR 1.60

Applicants are reminded that 37 CFR 1.60 was amended effective Feb. 27, 1983 to require applicants to furnish a copy of the prior application upon filing.

Some applicants continue to request that the copy be made by the Patent and Trademark Office as was done under the practice prior to Feb. 27, 1983. Others are filing a copy of the specification of the prior application, but not a copy of the oath or declaration. The Office will no longer make such copies as part of processing the new application.

The requirements of 37 CFR 1.60 must be complied with before a filing date will be granted for the continuing application.

It should be noted that 37 CFR 1.60 has been amended effective Apr. 1, 1984 to divide the section into paragraph (a) and new paragraph (b). Paragraph (a) adds a reference to amended 37 CFR 1.78(a) to clarify the conditions under which continuation or divisional applications may be filed. New paragraph (b) requires that the prior application be complete as set forth in 37 CFR 1.51(a) in order to properly file an application under 37 CFR 1.60. A complete application under 37 CFR 1.51(a) includes a signed oath or declaration. If the prior application was not a complete application (37 CFR 1.51(a)), a continuation or divisional application cannot be filed utilizing the provisions of 37 CFR 1.60 and any continuation or divisional application must include new application papers and be filed in accordance with 37 CFR 1.53.

Paragraph (b) of 37 CFR 1.60 also requires that a true copy of the prior complete application be filed. The copy must include the specification (including claims), drawings, oath or declaration showing the applicant's signature or an indication (on the oath or declaration) that it was signed, and any amendments referred to in the oath or declaration filed to complete the prior application. The copy of the prior application must be accompanied by a statement that the application papers filed are a true copy of the prior application and that no amendments referred to in the oath or declaration filed to complete the prior application introduced new matter therein. Such statement must be by the applicant or applicant's attorney or agent and must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. See the final rulemaking published in the Jan. 4, 1984 Federal Register at 49 FR 548-556 and reprinted in the Jan. 24, 1984 Official Gazette at 1038 O.G. 275-283.

GERALD J. MOSSINGHOFF
Apr. 6, 1984. *Commissioner of Patents and Trademarks.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,991,387, Burroughs Corp.; INDICATOR TUBE; **3,227,922, same,** ELECTRONIC INDICATOR CIRCUIT; **3,868,535, same,** MULTIPOSITION CHARACTER DISPLAY PANEL; **3,868,676, same,** DISPLAY PANEL ELECTRODE TERMINATION; **3,952,223, same,** MULTIPLE CHARACTER FLAT PANEL DISPLAY DEVICE, **filed** May 9, 1978, D.C.N.J. (Newark), Doc. 78-998, *Burroughs Corp. Beckman Instruments, Inc.* Order dismissing action filed July 15, 1980.

3,227,922. **(See 2,991,387.)**

3,591,483, Diamond Shamrock Corp., DIAPHRAGM-TYPE ELECTROLYTIC CELLS; **3,674,676, same,** EXPANDABLE ELECTRODES; **3,707,454, same,** ANODE AND BASE ASSEMBLY FOR ELECTROLYTIC CELLS, **3,793,163, same,** PROCESS USING ELECTROLYTE ADDITIVES FOR MEMBRANE CELL OPERATION; **3,928,166, same,** DIMENSIONALLY ADJUSTABLE ANODE-DIMENSIONALLY STABLE DIAPHRAGM COMBINATION FOR ELECTROLYTIC CELLS; **4,025,405, same,** ELECTROLYTIC PRODUCTION OF HIGH PURITY ALKALI METAL HYDROXIDE, **filed** Sept. 26, 1978, D.C., W.D.N.Y. (Buffalo), Doc. 79-714, *Hooker Chemicals & Plastics Corp., et al.* v. *Diamond Shamrock Corp., et al.*

3,674,676. **(See 3,591,483.)**

3,707,454. **(See 3,591,483.)**

3,793,163. **(See 3,591,483.)**

3,819,921, Texas Instruments Inc., MINIATURE ELECTRONIC CALCULATOR; **3,904,862, same,** CALCULATOR SYSTEM HAVING A CONSTANT MEMORY; **3,932,846, same,** ELECTRONIC CALCULATOR HAVING INTERNAL MEANS FOR TURNING OFF DISPLAY; **4,074,351, same,** VARIABLE FUNCTION PROGRAMMED CALCULATOR; **4,164,037, same,** ELECTRONIC CALCULATOR OR MICROPROCESSOR SYSTEM HAVING COMBINED DATA AND FLAG BIT STORAGE SYSTEM; **4,208,720, same,** CALCULATOR WITH ALGEBRAIC OPERATING SYSTEM, **filed** July 9, 1981, D.C.N.J. (Newark), Doc. 81-2157, *Casio Keisanki Kabushiki Kaisha* v. *Texas Instruments Inc.* Action transferred to Northern District of Texas on Mar. 17, 1982.

3,868,535. **(See 2,991,387.)**

3,868,676. **(See 2,991,387.)**

3,902,391, Hawker Siddeley Canada Ltd., BANDSAW APPARATUS AND DRIVE ASSEMBLY THEREFORE, **filed** Apr. 25, 1979, D.C. Ore.

(Portland), Doc. 79-412, *Kockums Industries, Inc.* v. *Hawker Siddeley Canada Ltd.*

3,903,878, Donald C. Spann, DEVICE FOR SUPPORTING A LIMB AND ASSOCIATED EXTREMITY; **3,938,205, same,** BODY POSITIONER; **3,939,829, same,** RESTRAINING CUFF; **3,946,451, same,** LIMB SUPPORT; **4,108,170, same,** PATIENT SUPPORT STRAP; **4,135,504, same,** ORTHOPEDIC SUPPORT, **filed** May 2, 1980, D.C., M.D. Fla. (Jacksonville), Doc. 80-397-Civ-J-M, *Span-America, Inc. and Donald C. Spann* v. *National Medical Products, Inc., doing business as Posi-Block.* Defendants are hereby enjoined from further infringement of Plaintiff's patents per Order filed Aug. 30, 1982.

3,904,862. (See 3,819,921.)

3,905,341, Performance Industries, Inc.; ENGINE VALVE MEANS AND PORTING; **4,062,331, same,** TWO CYCLE INTERNAL COMBUSTION ENGINE; **4,161,163, same,** TWO CYCLE INTERNAL COMBUSTION ENGINE; **4,202,298, same,** FUEL PORTING FOR TWO CYCLE INTERNAL COMBUSTION ENGINE; **4,202,299, same,** TWO CYCLE INTERNAL COMBUSTION ENGINE; **4,388,895, same,** FUEL PORTING FOR TWO CYCLE INTERNAL COMBUSTION ENGINE, **filed** Oct. 6, 1983, D.C., E.D. Pa. (Philadelphia), Doc. 83-4863, *Performance Industries, Inc.* v. *Honda Motor Co., Ltd., et al.*

3,915,290, Kimwood Corp., COOPERATING CONVEYOR CHAINS, **filed** Apr. 20, 1982, D.C. Minn. (Minneapolis), Doc. 4-82 Civ 638, *Kimwood Corp.* v. *Acrometal Co.'s, Inc., et al.* Consent Judgment filed on Aug. 12, 1983.

3,915,693, Robert T. C. Rasmussen, PROCESS, STRUCTURE AND COMPOSITION RELATING TO MASTER ALLOYS IN WIRE OR ROD FORM, **filed** Mar. 1, 1983, D.C., E.D. Pa. (Philadelphia), Doc. 83-1028, *Societe Vallouree* v. *Pfixer, Inc. and Robert T. C. Rasmussen.*

3,918,788, Electronics Stamping Corp., BUS CLIP AND BUS STRIP; **3,985,414, same,** BUS CLIP AND BUS STRIP CONSTRUCTION, **filed** Dec. 20, 1983, D.C., C.D. Calif. (Los Angeles), Doc. 83-8288 RG (Bx), *Electronics Stamping Corp.* v. *ICC, Inc., et al.*

3,926,470, Prince Corp., VISOR ASSEMBLY; **4,227,241, same, filed** Dec. 11, 1981, D.C., W.D. Mich. (Grand Rapids), Doc. 81-0927, *Prince Corp.* v. *Toyota Motor Sales Co., Ltd.* **Same, filed** Dec. 11, 1981, D.C., W.D. Mich. (Grand Rapids), Doc. 81-0928, *Prince Corp.* v. *Daimler-Benz A.G.*

3,928,166. (See 3,591,483.)

3,930,769, Vereinigte Nahrungsmittelindustrie Aktiengesellschaft, PROCESS AND APPARATUS FOR PRODUCING A THIN DOUGH MATERIAL; **3,991,220, same,** PROCESS FOR PRODUCING A THIN DOUGH MATERIAL, **filed** Jan. 4, 1980, D.C. District of Columbia (Wash. D.C.), Doc. 80-0024, *Everex Corp.* v. *Vereinigte Nahrungsmittelindustrie Aktiengesellschaft.* Final Judgment by Consent dated Apr. 7, 1981.

3,932,846. (See 3,819,921.)

3,934,274, John H. Hartley, Jr., DEFLATABLE MAMMARY AUGMENTATION PROSTHESIS, **filed** Dec. 17, 1981, D.C., C.D. Calif. (Los Angeles), Doc. CV-81 6357 MML (JRx), *John H. Hartley, Jr., et al.* v. *Minnesota Mining & Mfg. Co., et al.* Stipulation and Order dismissing action, including all claims and counterclaims with prejudice pursuant to Rule 41 dated Mar. 9, 1984.

3,395,074, Syva Co., ANTIBODY STERIC HINDRANCE IMMUNOASSAY WITH TWO ANTIBODIES, **filed** Aug. 4, 1981, D.C., N.D. Ohio (Toledo), Doc. C81-513, *Syva Co.* v. *Westgate Laboratory of Pathology, Inc.* Plaintiff voluntarily dismisses, without prejudice, the Complaint filed on Aug. 4, 1981, per Stipulation filed Feb. 4, 1983. **Same, filed** Feb. 5, 1980, D.C., N.D. Ill. (Chicago), Doc. 80 C 0592, *Syva Co.* v. *Miles Laboratories, Inc.* Judgment dismissing complaint entered for defendant, pursuant to Rule 58, on May 27, 1983.

3,938,205. (See 3,903,878.)

3,939,829. (See 3,903,878.)

3,941,926, Stewart-Warner Corp., VARIABLE INTENSITY DISPLAY DEVICE, **filed** May 28, 1981, D.C., N.D.N.Y. (Utica), Doc. 81-CV-556, *Stewart-Warner Corp.* v. *Conrac Corp., et al.*

3,943,974, ACF Industries, Inc., CONTROL VALVE FOR FLUID ACTUATOR; **4,074,702, same,** CONTROL VALVE FOR BLEEDING FLUID ACTUATOR; **4,194,529, same,** CONTROL VALVE HAVING INTEGRAL VISUAL INDICATOR FOR FLUID SAFETY SYSTEMS, **filed** Oct. 19, 1983, D.C., E.D. La. (New Orleans), Doc. 83-5150 M, *C.S.E. Automation Engineering and Services, Inc., doing business as Automation, USA and Wellcheck, Inc.* v. *ACF Industries, Inc., et al.*

3,946,451. (See 3,903,878.)

3,947,241, Heat & Control, Inc., FOOD TREATMENT APPARATUS AND PROCESS; **4,167,585, same,** METHOD FOR HEATING AND COOKING FOODS IN A CLOSED TREATMENT CHAMBER BY MAINTAINING THE TEMPERATURE AND MOISTURE CONTENT, **filed** Nov. 30, 1983, D.C., N.D. Calif. (San Francisco), Doc. C83 5734, *Stein Associates, Inc.* v. *Heat & Control, Inc.* (This case was transferred from the N.D. Ohio (Toledo), 83-575).

3,950,529, American Hospital Supply Corp., AMINO ACID FORMULATIONS FOR PATIENTS WITH LIVER DISEASE AND METHOD OF USING SAME, **filed** Apr. 28, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 2626, *American Hospital Supply Corp.* v. *Travenol Laboratories, Inc.*

3,952,223. (See 2,991,387.)

3,952,383, Chivas Products Ltd., STRAP FITTING FOR AUTOMOBILE INTERIOR AND OTHER USES; **3,977,054, same, filed** Nov. 12, 1982, D.C., E.D. Mich. (Detroit), Doc. 82-74274, *Chivas Products Ltd.* v. *Voplex Corp.* Judgment filed Nov. 14, 1983.

3,952,776, Dresser Industries, Inc., FLUID FLOW DEVICE; **4,231,383, same,** METHOD FOR CONTROLLING MASS FLOW RATE, **filed** Nov. 5, 1980, D.C., N.D. Tex. (Dallas), Doc. CA-3-80-1470G, *Dresser Industries, Inc.* v. *Ford Motor Co., et al.* Order of Dismissal without prejudice and Modifying Protective Order filed Apr. 9, 1982.

3,960,664, Microlife Technics, Inc., BACTERIAL PRODUCT USEFUL FOR MAKING SAUSAGE, **filed** June 2, 1983, D.C., N.D. Fla. (Tallahassee), Doc. GCA 83-0053-MMP, *Microlife Technics, Inc.* v. *Miles Laboratories, Inc.*

3,961,877, Fluoroware, Inc., REINFORCED WAFER BASKET, **filed** Oct. 21, 1983, D.C. Minn. (St. Paul), Doc. #3-83-1316, *Fluoroware, Inc.* v. *Empak, Inc.*

3,964,479, Cobe Laboratories, Inc., EXTRACORPOREAL BLOOD CIRCULATION SYSTEM AND DRIP CHAMBER WITH ADJUSTABLE BLOOD LEVEL; **4,102,655, same,** BUBBLE TRAP, **filed** Jan. 28, 1983, D.C. Colo. (Denver), Doc. 83-Z-145, *Cobe Laboratories, Inc.* v. *Northern Colorado Kidney Center.* Order of Dismissal without prejudice filed Oct. 3, 1983.

3,964,479, Cobe Laboratories, Inc., EXTRACORPOREAL BLOOD CIRCULATION SYSTEM AND DRIP CHAMBER WITH ADJUSTABLE BLOOD LEVEL, **filed** Dec. 14, 1983, D.C., E.D. Pa. (Philadelphia), Doc. 83-6008, *Cobe Laboratories, Inc.* v. *Extracorporeal Medical Specialties.*

3,968,600, National Utility Products Co., ADJUSTABLE MANHOLE COVER SUPPORT STRUCTURE, **filed** July 22, 1983, D.C., N.D. Ohio (Cleveland), Doc. C83-2994A, *National Utility Products Co.* v. *Raymond L. Fier, doing business as American Highway Products Co.* Dismissal with prejudice filed Oct. 6, 1983.

3,968,808, Nomadic Structures, Inc., COLLAPSIBLE SELF-SUPPORTING STRUCTURE; **4,290,244, same,** COLLAPSIBLE SELF-SUPPORTING STRUCTURES AND PANELS AND HUB THEREFOR, **filed** Nov. 10, 1981, D.C. Md. (Baltimore), Doc. Y-81-2897, *Nomadic Structures, Inc.* v. *John Goudie Associates, Inc., et al.* Plaintiff is the owner of Pat. Nos. 3,968,808 and 4,290,244 which are good and valid in law. Defendants are permanently enjoined against further infringing Plaintiff's patents. Consent Judgment filed Dec. 10, 1982.

3,968,824, John McLoughlin, PROTECTIVE COVER FOR EXTENDING SHAFTS, **filed** Feb. 24, 1984, D.C., M.D. Fla. (Tampa), Doc. 84-0046Civ-FTM-15, *John McLoughlin* v. *Edward A. Ewing, doing business as Ewing Industries.*

3,974,925, Girard J. McKenzie, LOADER AND TREE REMOVER, **filed** Aug. 8, 1979, D.C., M.D. Fla. (Tampa), Doc. 79-840-Civ-T.K., *Griffin Grove Service, Inc.* v. *Girard J McKenzie.* Defendant is the owner of the patent in suit. Plaintiff's suit seeking declaratory judgment of invalidity concerning Defendant's patent is hereby dismissed with prejudice per Final Consent Judgment filed Mar. 13, 1981.

3,977,054. (See 3,952,383.)

3,977,421, Burke R. Fallen, BUFFING MACHINE; **4,069,538, same,** DRIVE DISC AND PAD ASSEMBLY FOR FLOOR BUFFER; **4,155,138, same,** FLOOR BUFFING MACHINE; **4,307,480, same,** ROTATING PAD SUPPORT FOR FLOOR BUFFING MACHINE, **filed** Nov. 22, 1982, D.C., S.D. Tex. (Houston), Doc. H-82-3499, *Innovative Floor Systems, Inc.* v. *Diamond Speed Buff Co. and Burke R. Fallen.*

3,985,414. (See 3,918,788.)

3,987,854, Baker Oil Tools, Inc., GRAVEL PACKING APPARATUS AND METHOD, **filed** Feb. 24, 1984, D.C., W.D. La. (Shreveport), Doc. 84-0513, Sec. L, *Baker Oil Tools, Inc.* v. *Texas Iron Works, Inc.*

3,990,767, Thomas & Betts Corp., ELECTRICAL CONTACT AND CONNECTOR MEANS EMPLOYING SAME, **filed** Dec. 27, 1978, D.C. Del. (Wilmington), Doc. 78-552, *Thomas & Betts Corp.* v. *Winchester Electronics Div. of Litton Systems, Inc.* Judgment order entered Oct. 8, 1982 is hereby vacated. Pat. No. 3,990,767 is valid and infringed by Defendant. Defendant is permanently enjoined from making, using, or selling Winchester's so-called "single strut" transition connectors, per Amended Judgment Order dated Jan. 19, 1984.

3,991,220. (See 3,930,769.)

3,993,372, Peter Mihos, OVERHEAD CIGARETTE RACK, **filed** Oct. 5, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 6108, *Peter Mihos* v. *Concept Communications Co.*

3,993,520, Frank D. Werner, WINDSHIELD REPAIR APPARATUS AND METHOD, **filed** May 13, 1983, D.C., E.D. Pa. (Philadelphia), Doc. 83-2323, *Novus, Inc. and Frank D. Werner* v. *Glass Medic, Inc.*

3,995,102, Raceway Components, Inc., INSERT DEVICE FOR CABLES; **4,099,020, same,** APPARATUS FOR SEALING PASSAGES THROUGH A CONCRETE FLOOR AND ABOUT A CONDUCTOR, **filed** Oct. 20, 1983, D.C., S.D. W.Va. (Parkersburg), Doc. 83-A135, *Raceway Components, Inc.* v. *Butler Mfg. Co.* Action dismissed for failure to make service within 120 days on Mar. 8, 1984.

3,995,102, Raceway Components, Inc., INSERT DEVICE FOR CABLES, **filed** Nov. 15, 1983, D.C., S.D. W.Va. (Charleston), Doc. 83-A147, *Raceway Components, Inc.* v. *Butler Mfg. Co.*

3,995,443, Rudolf Iversen, AIR CONDITIONING SYSTEM, **filed** Oct. 13, 1982, D.C. Colo. (Denver), Doc. 82-F-1712, *Quantum Systems Corp., et al.* v. *Thermocycle Intl., Inc. and Rudolf Iversen.* Plaintiff dismisses Complaint agai Jan. 6, 1983.

4,024,330, B. F. Goodrich Co., INTERNALLY COATED REACTION VESSEL AND PROCESS FOR COATING THE SAME, **filed** Feb. 15, 1984, D.C., S.D. Tex. (Victoria), Doc. V-84-2, *B. F. Goodrich Co.* v. *Formosa Plastics Corp., U.S.A., et al.*

4,025,405. (See 3,591,483.)

4,057,704, Alexander Binzel Corp., GAS SHIELDED ARC WELDING TORCH, **filed** May 24, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 3558, *Alexander Binzel Corp.* v. *K & K Brothers Corp., et al.* Complaint and counterclaim are dismissed without prejudice, on motion by Plaintiff, on Mar. 16, 1984.

4,062,331. (See 3,905,341.)

4,069,538. (See 3,977,421.)

4,074,351. (See 3,819,921.)

4,074,702. (See 3,943,974.)

4,082,840, New England Nuclear Corp., BONE SEEKING TECHNETIUM 99M COMPLEX, **filed** Mar. 5, 1984, D.C., S.D. Ohio (Cincinnati), Doc. C-1-84-355, *New England Nuclear Corp.* v. *Mallinckrodt, Inc.*

4,099,020. (See 3,995,102.)

4,102,655. (See 3,964,479.)

4,108,170. (See 3,903,878.)

4,118,129, Qume Corp., ROTARY WHEEL PRINTING SYSTEM, **filed** Mar. 19, 1984, D.C.N.J. (Newark), Doc. 84-1042 S, *Olympia Werke Aktiengesellschaft, et al.* v. *Qume Corp.*

4,126,087, Willie J. McLamb, COOKER **filed** Feb. 15, 1983, D.C., W.D.N.C. (Statesville), Doc. ST-C-83-27, *National Kook-Rite Kooker Corp., et al.* v. *McLamb Enterprises, Inc. and Willie J. McLamb.* Voluntary Dismissal with prejudice filed Aug. 24, 1983.

4,135,504. (See 3,903,878.)

4,155,138. (See 3,977,421.)

4,161,163. (See 3,905,341.)

4,164,037. (See 3,819,921.)

4,167,585. (See 3,947,241.)

4,181,622, David C. Gavin, CLEANING COMPOSITION AND METHOD FOR REMOVING MARINE ACCUMULATIONS FROM SURFACES, **filed** Mar. 1, 1984, D.C., N.D. Miss. (Aberdeen), Doc. EC84-75-LS-P, *David C. Gavin* v. *Edwardian Enterprises, Inc., doing business as Buster's Marine.*

4,187,390, W. L. Gore and Associates, Inc., POROUS PRODUCTS AND PROCESS THEREFOR, **filed** Feb. 24, 1984, D.C.N.J. (Newark), Doc. 84-729, *W. L. Gore and Associates, Inc., et al.* v. *C. R. Bard, Inc.*

4,194,529. (See 3,943,974.)

4,202,298. (See 3,905,341.)

4,202,299. (See 3,905,341.)

4,208,720. (See 3,819,921.)

4,220,104, Paramount Textile Machinery Co., HOSIERY; **4,321,881, same,** METHOD AND APPARATUS FOR INSERTING ' GUSSET IN PANTIHOSE, **filed** Apr. 23, 1982, D.C., M.D.N.C. (Greens-

boro), Doc. C-82-445-G, *Paramount Textile Machinery Co.* v. *H. E. Crawford Co., Inc., et al.*

4,221,013, Angel M. Echevarria, FLUID FLOTATION SLEEP SYSTEM, **filed** Feb. 23, 1984, D.C., C.D. Calif. (Los Angeles), Doc. 84 1186 DWW (Bx), *Somma Mattress and Angel M. Echevarria* v. *Chappell of Calif., Inc., et al.*

4,222,318, Patton Electric Co., Inc., COMBINATION WINDOW AND FLOOR FAN, **filed** July 1, 1983, D.C., E.D. Pa. (Philadelphia), Doc. 83-3160, *Patton Electric Co., Inc.* v. *Lasko Metal Products, Inc.* Claims 1-3, 9-12, 20-22, and 25-32 of Pat. No. 4,222,318 are invalid. Judgment is entered in favor of Defendant and against Plaintiff on Feb. 21, 1984.

4,227,241. (See 3,926,470.)

4,231,077, James E. Joyce and John P. Joyce, LIGHT TOY, **filed** Feb. 1, 1984, D.C., E.D. Mich. (Detroit), Doc. 84CVO468DT, *James E. Joyce and John P. Joyce* v. *K-Mart Corp.*

4,231,383. (See 3,952,776.)

4,258,250, Copar Corp., JAM DETECTOR, **filed** June 22, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 4316, *Copar Corp.* v. *Valco Cincinnati, Inc.* Plaintiff having disclaimed Pat. No. 4,258,250, the patent in suit, by agreement of the parties, this cause is dismissed with prejudice and without costs. Dated Feb. 8, 1984.

4,265,393, Orco Sales Co., Inc., BOX CONSTRUCTION, **filed** Mar. 7, 1984, D.C., E.D. Mo. (St. Louis), Doc. 84-0566C (2), *Orco Sales Co., Inc.* v. *Arvco Container Corp., et al.*

4,290,244. (See 3,968,808.)

4,300,287, Larry T. Tibbs, CUTTING TOOL, **filed** Apr. 7, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 2413, *Larry T. Tibbs, et al.* v. *Gerald P. Wivinis, doing business as Wivco Tool Design Ltd., et al.* Plaintiff is the owner of Pat. No. 4,300,287 which is valid and enforceable per Stipulated Final Judgment and Decree dated Mar. 1, 1984.

4,307,480. (See 3,997,421.)

4,308,872, Respitrace Corp., METHOD AND APPARATUS FOR MONITORING RESPIRATION; **4,373,534, same,** METHOD AND APPARATUS FOR CALIBRATING RESPIRATION MONITORING SYSTEM, **filed** Feb. 2, 1984, D.C., N.D. Calif. (San Francisco), Doc. C-84-0496-JPV, *Respitrace Corp.* v. *Vitalog Corp.*

4,315,763, Stoller Enterprises, Inc., HIGH ANALYSIS LIQUID FERTILIZERS, **filed** Feb. 16, 1984, D.C. Neb. (Omaha), Doc. 84-0-124, *Stoller Enterprises, Inc.* v. *Paul Damron, doing business as Interstate Fertilizer Co.*

4,321,881. (See 4,220,104.)

4,364,677, Ceres Electronics Corp., METHOD AND MEANS OF RAPIDLY DISTINGUISHING A SIMULATED DIAMOND FROM NATURAL DIAMOND, **filed** Dec. 21, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 6702, *Presidium, Inc., et al.* v. *Ceres Electronics Corp.* Stipulation and Order dismissing case with prejudice dated Apr. 29, 1983.

4,372,624, Smith Intl., Inc., DYNAMIC C-RING SEAL, **filed** Nov. 23, 1983, D.C., C.D. Calif. (Los Angeles), Doc. 83-7613 PAR (Mcx), *Smith Intl., Inc.* v. *Hughes Tool Co.* Order dismissing action on grounds that Smith is attempting to litigate issues already before this Ct. in CV 72-1231-MML dated Mar. 15, 1984.

4,373,534. (See 4,308,872.)

4,388,895. (See 3,905,341.)

4,389,133, Acorn Corrugated Box Co., PLASTIC CONNECTORS FOR CORRUGATED MATERIAL, **filed** Feb. 16, 1984, D.C.N.J. (Newark), Doc. 84-0621 D, *Acorn Corrugated Box Co.* v. *Schiffenhaus Packaging Corp.*

4,392,119, U.S. Computer Systems, Inc., APPARATUS AND METHOD FOR MONITORING THE ARRIVAL AND DURATION OF STAY OF A VEHICLE AT A DRIVE-IN WINDOW, **filed** Feb. 14, 1984, D.C. Neb. (Lincoln), Doc. 84-L-92, *U.S. Computer Systems, Inc.* v. *Automated Electronics.*

4,395,043, Keystone Bingo Products, Inc., GAME CHIP, **filed** Oct. 24, 1983, D.C., S.D.N.Y., Doc. 83-Civ-7756 EW, *Keystone Bingo Products, Inc.* v. *Winston Chen.* **Same, filed** Nov, 2, 1983, D.C.N.J. (Newark), Doc. 83-4206, *Keystone Bingo Products, Inc.* v. *Winston Chen (Winston Imports Corp.).* **Same, filed** Sept. 9, 1983, D.C., E.D. Pa. (Philadelphia), Doc. 83-4385, *Keystone Bingo Products, Inc.* v. *Joseph A. Holko.* Plaintiff is the owner of Pat. No. 4,395,043 which is good and valid in law. Defendants hereby permanently enjoined against further infringing Plaintiff's patent. Final Judgment by Consent filed Nov. 18, 1983. **Same, filed** Sept. 14, 1983, D.C.N.J. (Trenton), Doc. 83-3451, *Keystone Bingo Products* v. *Two Jay's Bingo Supplies, Inc., et al.* Plainfiff is the owner of Pat. No. 4,395,043 which is good and valid in law. Defendants are hereby permanently enjoined against further infringing Plaintiff's patent. Final Judgment by Consent filed Feb. 9, 1984.

4,419,100, Hollister, Inc., OSTOMY APPLIANCE AND FACEPLATE ATTACHMENT THEREFOR, **filed** Mar. 6, 1984, D.C., N.D. Ill. (Chicago), Doc. 84 C 1987, *Hollister, Inc.* v. *E. R. Squibb & Sons, Inc.*

4,420,053, Litco Intl., Inc., FORK LIFT WEIGHING APPARATUS, **filed** Feb. 17, 1984, D.C., N.D. Ohio (Youngstown), Doc. C84-562-Y, *Litco Intl., Inc.* v. *Frank Russo, doing business as High Teck Intl.*

DEPARTMENT OF COMMERCE

Patent and Trademark Office

37 CFR Part 1

Proposed Rules for Patent Maintenance Fees

AGENCY: Patent and Trademark Office

ACTION: Notice of proposed rulemaking

SUMMARY: The Patent and Trademark Office proposes to amend the rules of practice in patent cases, Part I of Title 37, Code of Federal Regulations, to provide rules and procedures for the payment of patent maintenance fees. Public Law 96-517, enacted on December 12, 1980 and Public Law 97-247, enacted on August 27, 1982, provided for the payment of maintenance fees at intervals of 3½, 7½ and 11½ years from the date of grant of the patent for maintaining in force an original patent, a reissue patent of an invention, and under Public Law 96-517, a plant patent and reissues thereof. The proposed changes are intended to provide specific rules and procedures which will assist patentees in avoiding the inadvertent expiration of a patent for failure to pay the appropriate maintenance fee.

DATES: Comments must be submitted on or before June 26, 1984; a public hearing will be held on June 26, 1984, at 9:30 a.m., requests to present oral testimony should be received on or before June 19, 1984.

ADDRESS: Address written comments and requests to present oral testimony to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: R. Franklin Burnett, Room 3-11A13. The hearing will be held in Room 11C10, on the 11th floor of Building 3, Crystal Plaza, located at 2021 Jefferson Davis Highway, Arlington, Virginia. Written comments and a transcript of the public hearing will be available for public inspection in Room 11A13 of Building 3, Crystal Plaza at 2021 Jefferson Davis Highway, Arlington, Virginia.

FOR FURTHER INFORMATION CONTACT: R. Franklin Burnett by telephone at (703) 557-3054 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: This proposed rule change is designed primarily to 1) establish a set of rules and procedures for the payment of patent maintenance fees; and 2) effect the provisions of Public Laws 96-517 and 97-247 with respect to payment of maintenance fees.

DISCUSSION OF SPECIFIC RULES

Section 1.1, if amended as proposed, would add a proposed new paragraph (d) to provide a "Box M. Fee" in the Patent and Trademark Office to which all maintenance fee correspondence and payments should be directed. Changes in small entity status in patents and changes in the "fee address" under §1.363, as well as payments of maintenance fees should be directed to "Box M. Fee".

The proposed change in §1.9, paragraph (d) is a mere change in citation and title of the rule of the Small Business Administration which relates to the small business size standard for paying reduced patent fees. This change was published in the Federal Register as a final rule on February 9, 1984 at 49 Fed. Reg. 5024-5048. The wording of the rule itself was not changed. This change is proposed to bring the wording of title 37, Code of Federal Regulations into conformance with title 13, Code of Federal Regulations.

Section 1.17, if amended as proposed, would establish in paragraph (h) a fee of $120 for review of a decision refusing to accept and record payment of a maintenance fee filed prior to the expiration of a patent. Paragraph (h) of §1.17 is also proposed to be amended to establish a fee of $120 for reconsideration of a decision on petition refusing to accept the delayed payment of a maintenance fee in an expired patent.

Section 1.19, if amended as proposed, would add proposed new paragraphs (f) and (g). Proposed new paragraph (f) would provide for a $10.00 fee for a microfiche copy of a patent file wrapper record. Microfiche copies of these patent files have recently become available for patents issued after January 1, 1984. No fee had previously been set by rule for this service. This fee is not directly related to maintenance fees but is proposed here for convenience. Proposed new paragraph (g) would establish a $3.00 fee for providing an uncertified statement indicating either the status of payment of maintenance fees due on a patent or the expiration of a patent. This charge does not apply to the receipt normally provided to the fee addressee as a result of the payment of a maintenance fee, but would apply any other time written evidence of the status of payment of maintenance fees on a patent is requested, whether by the patentee or a member of the public.

Section 1.20, if amended as proposed, would add new paragraphs (k), (l) and (m). Proposed new paragraph (k) would provide for a $100.00 surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after December 12, 1980 and before August 27, 1982. Since Public Law 96-517 did not provide for small entities, the surcharge amount of $100 applies to all such patents. Proposed new paragraph (l) would provide for a $100 surcharge for patentees other than a small entity and a $50 surcharge for small entity patentees when paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant based on an application filed on or after August 27, 1982. This surcharge of $100 is subject to a 50% reduction for small entities pursuant to Public Law 97-247. Proposed new paragraph (m) would provide for a $500 surcharge for accepting payment of a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee. This $500 surcharge applies only under Public Law 97-247 where the patent is based on an application filed on or after August 27, 1982 and where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable. The requirement that the delay be "unavoidable" is the same as that for reviving an abandoned

application under 35 U.S.C. 133. However, the amount of evidence required will depend upon when the showing that the delay was "unavoidable" is made. This surcharge does not apply to patents based on applications filed prior to August 27, 1982 since acceptance of a maintenance fee after expiration of a patent for non-timely payment is not possible under Public Law 96-517. Since this surcharge is provided for under 35 U.S.C. 41(c), it is not subject to a 50% reduction for small entities. The surcharge in proposed paragraph (m) is not in addition to the surcharge in proposed paragraph (l), but is in lieu thereof.

Section 1.33, if amended as proposed, would add a new paragraph (d) which would allow a "correspondence address" or change thereto to be filed during the enforceable life of the patent. The "correspondence address" would be used in correspondence relating to maintenance fees unless a separate "fee address" has been specified. Proposed paragraph (d) would also include a reference to proposed §1.363 relating to the "fee address" to be used for maintenance fee purposes.

A new §1.362 is proposed to be added to provide for times for payment of maintenance fees. Proposed new paragraph (a) would set forth the requirement that maintenance fees as set forth in §1.20(e)-(j) must be paid in order to maintain a patent in force if the application maturing into a patent was filed on or after December 12, 1980 and is subject to the payment of maintenance fees. The maintenance fee amounts set in §1.20(e)-(g) are subject to adjustment in accordance with the provisions of Public Law 96-517. The maintenance fee amounts set in §1.20(h)-(j) are subject to adjustment in accordance with the provisions of Public Law 97-247 on October 1, 1985, and every third year thereafter, to reflect fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Other patent fees are also subject to similar adjustments.

Proposed new paragraph (b) of §1.362 would stipulate that no maintenance fees are due for plant patents if the plant patent application was filed on or after August 27, 1982 or for any design patents. Maintenance fees are not required for a reissue patent if the patent being reissued did not require maintenance fees. Proposed new paragraph (c) would define the pertinent application filing dates for purposes of determining whether maintenance fees are applicable. Paragraph (c)(1) would establish that for national applications not claiming benefit of an earlier application, the actual United States filing date controls. Paragraph (c)(2) would establish that for national applications claiming benefit of an earlier foreign application under 35 U.S.C. 119, the United States filing date controls. Paragraph (c)(3) would provide that for continuing national applications claiming benefit of a prior application under 35 U.S.C. 120, the actual United States filing date of the continuing application is the controlling date. Paragraph (c)(4) would provide that for a reissue application, the United States filing date of the application which matured into the original patent upon which the reissue application is based would control. Paragraph (c)(5) would establish that for an international application which has entered the United States as a designated office under 35 U.S.C. 371, the international filing date granted under Article 11(1) of the Patent Cooperation Treaty controls. This is consistent with 35 U.S.C. 363.

Paragraph (d) of proposed new §1.362 would set forth the time periods when maintenance fees could be paid without a surcharge. Those periods, referred to generally as the "window period," are the six month periods preceding each due date, i.e., 3 years through 3 years and six months, 7 years through 7 years and six months, and 11 years through 11 years and six months after grant of the patent. The "due dates" are defined in 35 U.S.C. 41(b). A maintenance fee paid on the last day of a window period could be paid without surcharge. The last day of a window period is the same date (anniversary date) the patent was granted 3 years and six months, 7 years and six months, or 11 years and six months after grant of the patent.

Paragraph (e) of proposed new §1.362 would set forth the grace periods during which maintenance fees, under either Public Law 96-517 or Public law 97-247, may be paid with the surcharge under §1.20(k) or (l). The grace periods are the six month periods immediately following each due date, i.e., after 3 years and six months and up to 4 years, after 7 years and six months and up to 8 years, and after 11 years and six months and up to 12 years after grant of the patent. A maintenance fee may be paid with the surcharge on the same date (anniversary date) the patent was granted in the 4th, 8th, or 12th year after grant to prevent the patent from expiring.

Paragraph (f) of proposed new §1.362 would specify that where the last day for paying a maintenance fee falls on a Saturday, Sunday, or a federal holiday within the District of Columbia, the maintenance fee may be paid on the next succeeding day which is not a Saturday, Sunday, or federal holiday. For example, if the "window period" provided by proposed paragraph (d) for paying a maintenance fee without surcharge ended on a Saturday, Sunday, or a federal holiday within the District of Columbia, the maintenance fee could be paid without surcharge on the next succeeding day which is not a Saturday, Sunday, or federal holiday. Likewise, if the grace period provided by proposed paragraph (e) for paying a maintenance fee with surcharge ended on a Saturday, Sunday, or a federal holiday within the District of Columbia, the maintenance fee could be paid with surcharge on the next succeeding day which is not a Saturday, Sunday, or federal holiday. In the latter situation, the failure to pay the maintenance fee and surcharge on the next succeeding day which is not a Saturday, Sunday, or federal holiday would result in the patent expiring on a date (4, 8, or 12 years after the date of grant) earlier than the last date on which the maintenance fee and surcharge could be paid. This situation results from the provisions of 35 U.S.C. 21, but those provisions do not extend the expiration date of the patent if the maintenance fee and any required surcharge are not paid when required. For example, if the grace period ended on Saturday, the maintenance fee and surcharge could be paid on the next succeeding business day, e.g. Monday, but the patent would have expired on Saturday if the maintenance fee and surcharge were not paid on the following Monday.

Paragraph (g) of proposed new §1.362 would establish that if the proper fees are not received within the time period specified in paragraphs (d), (e), or (f) the patent would expire at the end of the grace period set forth in paragraph (e). Paragraph (g) also specifies that a patent which expires for the failure to pay the maintenance fee will expire at the end of the same date

(anniversary date) the patent was granted in the 4th, 8th, or 12th year after grant.

Proposed new §1.363, if added as proposed, would provide for a "fee address" for maintenance fee purposes. Proposed new paragraph (a) would specify that the correspondence address used during prosecution of the application would be used unless 1) a "fee address" is provided for maintenance fee purposes when submitting the issue fee, 2) a correspondence address change for all purposes is filed after payment of the issue fee, or 3) a "fee address" or a change in the "fee address" is filed after payment of the issue fee.

Paragraph (b) of proposed new §1.363 would specify that an assignment does not result in a change of address for maintenance fee purposes. Due to the possible expiration of a patent for failure to timely pay the appropriate maintenance fee, patentees should ensure that the Patent and Trademark Office is properly notified of the proper "fee address" to which all maintenance fee communications are to be directed. Under both Public Law 96-517 and Public Law 97-247 the burden is on the patentee to timely pay maintenance fees. The Patent and Trademark Office will attempt to assist patentees through appropriate courtesy notices. However, the failure to receive one or more notices will not relieve the patentee of the obligation to timely pay the appropriate maintenance fee to prevent the patent from expiring by operation of law if the appropriate maintenance fee is not paid. Proposed §1.363 does not provide for maintenance fee correspondence to be directed to more than one address.

Proposed new §1.366, if added as proposed, would establish the guidelines and procedures for submission of maintenance fees, including any necessary surcharges. Proposed new paragraph (a) would state that the patentee may pay maintenance fees or any person or organization may pay maintenance fees on behalf of the patentee without filing in the Patent and Trademark Office evidence of authorization by the patentee to pay maintenance fees. This will enable patentees to pay the maintenance fees themselves or authorize some person or organization to pay maintenance fees on their behalf. No verification of the authority to pay maintenance fees in a particular patent will be made by the Patent and Trademark Office. While anyone may pay the maintenance fees on a patent, any Patent and Trademark Office notices relating to maintenance fees will be mailed to the "fee address" set forth in proposed §1.363.

Paragraph (b) of proposed new §1.366 specifies that a maintenance fee and any necessary surcharge for a patent must be submitted in the proper amount and at the proper time, i.e., within the periods set forth in proposed §1.362. The maintenance fee and any necessary surcharge may be paid in the manner set forth in §1.23, i.e., it should be in United States specie, Treasury notes, national bank notes, post office money orders, or by certified check. As indicated in §1.23, if the maintenance fee payment is sent in any other form, the Office may delay or cancel the credit until collection is made. For example, a personal or other uncertified check drawn on a United States bank which is not immediately negotiable, e.g., because of lack of signature or insufficient funds, would not constitute payment of a maintenance fee. However, a personal check drawn on a United States bank can be used if it is immediately negotiable. Any remittances from

foreign countries must be payable and immediately negotiable in the United States for the full amount of the maintenance fee required.

Paragraph (b) of proposed new §1.366 also provides that maintenance fees may be paid by an authorization to charge a deposit account established pursuant to §1.25. The authorization to charge the deposit account must be submitted within the periods set forth in §1.362 and must be limited to maintenance fees payable on the date of submission. The authorization to charge the deposit account could not, under paragraph (b), be submitted prior to the third, seventh, or eleventh year after the grant of the patent. If an authorization to charge a deposit account were submitted to pay the maintenance fee due at three years and six months after grant, a new authorization to charge a deposit account or other form of payment would have to be submitted at the appropriate time for each of the maintenance fees due at 7 years and six months and 11 years and six months. Proposed paragraph (b) also specifies that any payment or authorization filed at any time other than that set forth in proposed §1.362(d) or (e) will not serve as a payment of the maintenance fee, except insofar as a delayed payment of the maintenance fee is accepted by the Commissioner pursuant to proposed §1.378. Paragraph (b) as proposed also specifies that a payment of less than the required amount, a payment in a manner other than that set forth in §1.23, or the filing of an authorization to charge a deposit account having insufficient funds, will not constitute payment of a maintenance fee on a patent. The authorization is required to authorize the immediate charging of the fee to the deposit account. An authorization would be improper if it only authorized the fee to be charged at a later date, e.g., on the last possible day of payment without surcharge. Such an authorization would not serve as payment of the maintenance fee. Any payment which fails to result in the entire proper amount of the maintenance fee being present on the due date will not constitute payment of the maintenance fee. Paragraph (b) also specifies that the certificate of mailing procedures of §1.8 or the mailing by "Express Mail" provisions of §1.10 may be utilized in paying maintenance fees. The specific requirements of either §1.8 or §1.10 must be fully complied with if either is used.

Proposed paragraph (c) of new §1.366 would establish the data necessary and desired when submitting maintenance fee payments. Proposed new paragraph (c) would specify that maintenance fee payments must include at least the 1) patent number, 2) patent issue date, 3) United States application serial number and 4) United States application filing date. This information is necessary as a cross-check so that the fee will be credited to the proper patent. If less than the required information is submitted, the Office cannot ensure that proper credit will be made. Additionally, if notice is required that the proper identifying data has not been submitted, it would result in requiring the payment of a surcharge if the necessary data is submitted after the "window period" closes and was necessary to properly identify the patent for which the fee was being paid.

Paragraph (d) of proposed new §1.366 would specify that the following information should also be submitted: 1) whether it is the 3½, 7½, or 11½ year fee, 2) whether small entity status is being claimed with the payment and 3) the amount of the

maintenance fee and any surcharge being submitted. Although the submission of this information is not mandatory, it would expedite the processing of the maintenance fee payments.

Paragraph (e) of proposed new §1.366 would specify that maintenance fee payments and any surcharges relating thereto must be submitted separate from any other payments for fees or charges, whether submitted in the manner set forth in §1.23 or by an authorization to charge a deposit account. Maintenance fee payments and surcharge payments relating thereto which are co-mingled with payments for other fees or charges, e.g., application filing fees, issue fees, document supply fees, etc., will not be accepted. The maintenance fees require processing by a separate area of the Office and are not processed in the same manner as other fees and charges. Maintenance fees for a number of patents can be submitted together in one submission and one payment. Paragraph (e) specifies that if maintenance fee payments for more than one patent are submitted together, they should be submitted on as few sheets as possible, listing the patent numbers in increasing patent number order. If the payment submitted, which can be made as a single payment, is insufficient to cover the maintenance fees and surcharges for all the listed patents, the payment will be applied in the order the patents are listed. In such a circumstance where the fees are insufficient, the maintenance fee for one or more of the last listed patents will not be paid.

Paragraph (f) of proposed new §1.366 serves as a reminder to patentees of the necessity to check for the loss of small entity status prior to paying each maintenance fee on a patent. This is already a requirement of §1.28(b). Paragraph (f) provides that notification of any change in status resulting in loss of entitlement to small entity status must be filed in a patent prior to paying, or at the time of paying, the earliest maintenance fee due after the date on which status as a small entity is no longer appropriate. If status as a small entity has been previously established by filing a statement and such status is checked and is found to be proper, no notification is required. It is not necessary to file new verified statements claiming small entity status at this point if the status as a small entity is still proper even if rights have been transferred to a small entity who has not previously filed a verified statement. The requirement is to notify the Patent and Trademark Office of the loss of entitlement and to pay the maintenance fee in the proper amount for other than a small entity where appropriate. The refund provisions of §1.28(a) for later submitted small entity statements will apply to maintenance fees.

Paragraph (g) of proposed new §1.366 would provide that maintenance fees and surcharges relating thereto will not be refunded except in accordance with §§1.26 and 1.28(a). A patentee cannot obtain a refund of a maintenance fee which was due and payable on the patent.

Proposed new §1.377, if added as proposed, would provide a mechanism for review of a decision refusing to accept and record payment of a maintenance fee filed prior to the expiration of a patent. Paragraph (a) of proposed new §1.377 specifies that a patentee who is dissatisfied with the refusal of the Patent and Trademark Office to accept and record a maintenance fee which was

filed prior to the expiration of the patent may petition the Commissioner to accept and record the maintenance fee.

Paragraph (b) of proposed new §1.377 specifies that any petition under proposed new §1.377 must be filed within 2 months of the action complained of, or within such other time as may be set in the action complained of. The petition must be accompanied by the petition fee of $120 provided for in the proposed amendment to §1.17(h). Paragraph (b) also provides that the petition may include a request that the petition fee be refunded if the refusal to accept and record the maintenance fee is determined to have resulted from an error by the Patent and Trademark Office.

Paragraph (c) of proposed new §1.377 specifies that any petition filed under the section must comply with the requirements of paragraph (b) of §1.181 and must be signed by an attorney or agent registered to practice before the Patent and Trademark Office, or by the patentee, the assignee, or other party in interest. The petition must be in the form of a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

Proposed new §1.378, if added as proposed, would establish the procedures for acceptance of the delayed payment of a maintenance fee in an expired patent in order to reinstate that patent. This procedure is only available under Public Law 97-247 where the application on which the patent is based was filed on or after August 27, 1982. If the maintenance fee is due under Public Law 96-517, i.e., the application on which the patent is based was filed on or after December 12, 1980, and before August 27, 1982, the delayed payment of the maintenance fee cannot be accepted after expiration of the patent and the patent cannot be reinstated.

Paragraph (a) of proposed new §1.378 provides that the Commissioner may accept the payment of any maintenance fee due on a patent based on an application filed on or after August 27, 1982, after expiration of the patent if, upon petition, the delay in payment of the maintenance fee is shown to the satisfaction of the Commissioner to have been unavoidable. The surcharge required by §1.20(m) must be paid as a condition of accepting payment of the maintenance fee. No separate petition fee is required for this petition. If the Commissioner accepts payment of the maintenance fee upon petition, the patent shall be considered as not having expired, but would be subject to the intervening rights provisions of 35 U.S.C. 41(c)(2).

Paragraph (b) of proposed new §1.378 specifies the requirements of a petition for acceptance of the delayed payment of a maintenance fee filed within six months of the expiration of the patent. Under proposed paragraph (b), the petition must include the required maintenance fee set forth in §1.20(h)-(j); the surcharge set forth in proposed §1.20(m); and a showing that the delay was unavoidable since reasonable care was taken to ensure that the maintenance fee would be paid timely. The showing must enumerate the steps taken to ensure timely payment of the maintenance fee. In view of the requirement to enumerate the steps taken to ensure timely payment of the maintenance fee, an argument that the patentee was ignorant of the requirement to pay maintenance fees would not constitute a showing of unavoidable delay. Evidence that despite reasonable care on behalf of the

patentee and/or the patentee's agents, and reasonable steps to ensure timely payment, the maintenance fee was unavoidably not paid, could be submitted in support of an argument that the delay in payment was unavoidable. For example, an error in a docketing system could possibly result in a finding that a delay in payment was unavoidable if it were shown that reasonable care was exercised in designing and operating the system and if it were shown that the patentee took reasonable steps to ensure that the patent was entered into the system to ensure timely payment of the maintenance fees.

Paragraph (c) of proposed new §1.378 specifies the requirements of a petition for acceptance of the delayed payment of a maintenance fee filed more than six months after the expiration of a patent. These requirements are much more stringent in view of the heavy burden of proof that the delay was unavoidable. The legislative history of Public Law 97-247, House Report No. 97-542 (Committee on the Judiciary), indicates that "[a]fter the expiration of a reasonable period of time, the patentee would bear a heavy burden of proof that the delay was unavoidable." The six month period provided for petition under proposed paragraph (b) is considered to be a reasonable period of time within which to seek reinstatement of a patent which expired for failure to pay the maintenance fee. Any petition filed more than six months after expiration must meet the more stringent requirements of proposed paragraph (c). Under proposed paragraph (c), the petition must include the same elements as in proposed paragraph (b) and, in addition, must demonstrate that the failure to pay the maintenance fee was unavoidable due to circumstances outside of the control of the patentee and those acting on behalf of the patentee in paying the maintenance fee. The showing in a petition under paragraph (c) must be sufficient in scope and content to meet the heavy burden of proof required to show that a delay in payment of the maintenance fee of more than six months after expiration of the patent was unavoidable. In contrast to a petition under proposed paragraph (b), a showing in a petition under proposed paragraph (c) of an error in a docketing system would not be sufficient to find that the delay was unavoidable. Instead, a petition filed under paragraph (c) must demonstrate that the circumstances resulting in the delay were entirely outside the control of the patentee and those acting on behalf of the patentee in paying the maintenance fee, e.g., serious efforts without success to raise the funds required to pay the maintenance fee.

Paragraph (d) of proposed new §1.378 would require that a petition filed under proposed new §1.378 be signed by an attorney or agent registered to practice before the Patent and Trademark Office, or by the patentee, the assignee, or other party in interest. Under proposed paragraph (d), the petition must be in the form of a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

Paragraph (e) of proposed new §1.378 provides a mechanism for obtaining reconsideration of a decision refusing to accept a maintenance fee upon petition filed pursuant to paragraph (a). This mechanism is a petition for reconsideration which may be filed within two months of, or such other time as set in the decision refusing to accept the delayed payment of the maintenance fee. In contrast to petitions filed under proposed paragraph (a), the petition for reconsideration filed under

proposed paragraph (e) of new §1.378 would require the separate petition fee set forth in the proposed amendment to §1.17(h). Proposed paragraph (e) also provides that after the decision on the petition for reconsideration, no further reconsideration or review of the matter will be undertaken by the Commissioner. Proposed paragraph (e) also provides for refund of the maintenance fee and the surcharge set forth in §1.20(m) if the delayed payment of the maintenance fee is not accepted. The refund would be made following the decision on the petition for reconsideration, or after the expiration of the time for filing such a petition for reconsideration, if none is filed. Proposed paragraph (e) specifies that the fee for filing the petition for reconsideration will not be refunded unless the refusal to accept and record the maintenance fee is determined to result from an error by the Patent and Trademark Office.

Environmental, energy, and other considerations: The proposed rule change will not have a significant impact on the quality of the human environment or conservation of energy resources.

The proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). Public Law 96-517 and 97-247 have both taken into consideration the impact they may have on small entities.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change does not contain a collection of information requirement for the purpose of the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interests, Courts, Inventions and patents, Lawyers.

Notice is hereby given that pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, Pub. L. 96-517 and Pub. L. 97-247, the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations as set forth below.

It is proposed to amend 37 CFR, Part I, as follows with deletions indicated by brackets and additions by arrows.

1. Section 1.1 is proposed to be amended by adding a new paragraph (d) to read as follows:

§1.1 All communications to be addressed to Commissioner of Patents and Trademarks.

* * * * *

▶(d) Payments of maintenance fees in patents and other communications relating thereto should be additionally marked "Box M. Fee."◀

2. Paragraph (d) of §1.9 is proposed to be amended by changing the citation "13 CFR 121.3-18, published on September 30, 1982 at 47 FR 43273." to "13 CFR 121.12." and by changing the words "§121.3-18 Definition of small business for paying reduced patent fees under Title 35, U.S. Code" to "§121.12 Small business for paying reduced patent fees."

3. Section 1.17 is proposed to be amended by adding to the end of paragraph (h) the following:

§1.17 Patent application processing fees.

* * * * *

(h) * * *

▶- §1.377 - for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent

- §1.378(e) - for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in expired patent◀

4. Section 1.19 is proposed to be amended by adding new paragraphs (f) and (g) to read as follows:

§1.19 Document supply fees.

* * * * *

▶(f) Microfiche copy of patent file record----------$10.00

(g) Uncertified statement as to status of the payment of maintenance fees due on a patent or expiration of a patent----------$ 3.00◀

5. Section 1.20 is proposed to be amended by adding new paragraphs (k), (l) and (m) to read as follows:

§1.20 Post-issuance fees.

* * * * *

▶(k) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an

application filed on or after December 12, 1980 and before August 27, 1982----------$100.00

(l) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after August 27, 1982:

By a small entity (§1.9(f))----------$ 50.00

By other than a small entity----------$100.00

(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after August 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable----------$500.00 ◀

6. Section 1.33 is proposed to be amended by adding a new paragraph (d) to read as follows:

§1.33 Correspondence respecting patent applications, reexamination proceedings, and other proceedings.

* * * * *

▶(d) A "correspondence address" or change thereto may be filed with the Patent and Trademark Office during the enforceable life of the patent. The "correspondence address" will be used in any correspondence relating to maintenance fees unless a separate "fee address" has been specified. See §1.363 for "fee address" used solely for maintenance fee purposes.◀

7. A new §1.362 is proposed to be added to read as follows:

▶§1.362 Time for payment of maintenance fees.

(a) Maintenance fees as set forth in §1.20(e)-(j) are required to be paid in all patents based on applications filed on or after December 12, 1980, except as noted in paragraph (b) of this section, to maintain a patent in force beyond 4, 8 and 12 years after the date of grant.

(b) Maintenance fees are not required for plant patents based on applications filed on or after August 27, 1982 or for any design patents. Maintenance fees are not required for a reissue patent if the patent being reissued did not require maintenance fees.

(c) The application filing dates for purposes of payment of maintenance fees are as follows:

(1) For an application not claiming benefit of an earlier application, the actual United States filing date of the application.

(2) For an application claiming benefit of an earlier foreign application under 35 U.S.C. 119, the United States filing date of the application.

(3) For a continuing (continuation, division, continuation-in-part) application claiming the benefit of a prior patent application under 35 U.S.C. 120, the actual United States filing date of the continuing application.

(4) For a reissue application, the United States filing date of the original non-reissue application on which the patent reissued is based.

(5) For an international application which has entered the United States as a designated Office under 35 U.S.C. 371, the international filing date granted under Article 11(1) of the Patent Cooperation Treaty which is considered to be the United States filing date under 35 U.S.C. 363.

(d) Maintenance fees may be paid in patents without surcharge during the periods extending respectively from:

(i) 3 years through 3 years and 6 months after grant for the first maintenance fee,

(ii) 7 years through 7 years and 6 months after grant for the second maintenance fee,

(iii) 11 years through 11 years and 6 months after grant for the third maintenance fee,

(e) Maintenance fees may be paid with the surcharge set forth in §1.20(k) or (l) during the respective grace periods after:

(i) 3 years and 6 months and through the day of the 4th anniversary of the grant for the first maintenance fee,

(ii) 7 years and 6 months and through the day of the 8th anniversary of the grant for the second maintenance fee, and

(iii) 11 years and 6 months and through the day of the 12th anniversary of the grant for the third maintenance fee.

(f) If the last day for paying a maintenance fee without surcharge set forth in paragraph (d) of this section, or the last day for paying a maintenance fee with surcharge set forth in paragraph (e) of this section, falls on a Saturday, Sunday, or a federal holiday within the District of Columbia, the maintenance fee may be paid under paragraph (d) or paragraph (e) respectively on the next succeeding day which is not a Saturday, Sunday, or federal holiday.

(g) Unless the maintenance fee and any applicable surcharge is paid within the time periods set forth in paragraphs (d), (e) or (f) of this section, the patent will expire as of the end of the grace period set forth in paragraph (e) of this section. A patent which expires for the failure to pay the

maintenance fee will expire at the end of the same date (anniversary date) the patent was granted in the 4th, 8th, or 12th year after grant.◀

8. A new §1.363 is proposed to be added to read as follows:

▶§1.363 Fee address for maintenance fee purposes.

(a) All notices, receipts, refunds, and other communications relating to payment or refund of maintenance fees will be directed to the correspondence address used during prosecution of the application as indicated in §1.33(a) unless:

(1) a "fee address" for purposes of payment of maintenance fees is set forth when submitting the issue fee, or

(2) a change in the correspondence address for all purposes is filed after payment of the issue fee, or

(3) a "fee address" or a change in the "fee address" is filed for purposes of receiving notices, receipts and other correspondence relating to the payment of maintenance fees after the payment of the issue fee, in which instance, the latest such address will be used.

(b) An assignment of a patent application or patent does not result in a change of the "correspondence address" or "fee address" for maintenance fee purposes.◀

9. A new §1.366 is proposed to be added to read as follows:

▶§1.366 Submission of maintenance fees.

(a) The patentee may pay maintenance fees, or any person or organization may pay maintenance fees on behalf of a patentee. Authorization by the patentee need not be filed in the Patent and Trademark Office to pay maintenance fees on behalf of the patentee.

(b) A maintenance fee and any necessary surcharge submitted for a patent must be submitted in the proper amount and may be paid in the manner set forth in §1.23 or by an authorization to charge a deposit account established pursuant to §1.25. Payment of a maintenance fee and any necessary surcharge or the authorization to charge a deposit account must be submitted within the periods set forth in §1.362(d) or (e). Any payment or authorization of maintenance fees and surcharges filed at any other time will not be accepted and will not serve as a payment of the maintenance fee except insofar as a delayed payment of the maintenance fee is accepted by the Commissioner in an expired patent pursuant to a petition filed under §1.378. Any authorization to charge a deposit account must authorize the immediate charging of the maintenance fee and any necessary surcharge to the deposit account. Payment of less than the required amount, payment in a manner other than that set forth in §1.23, or the filing of an authorization to charge a deposit account having insufficient funds will not constitute payment of a maintenance fee or surcharge on a patent. The certificate of mailing procedures of either

§1.8 or §1.10 may be utilized in paying maintenance fees and any necessary surcharges.

(c) In submitting maintenance fees, identification of the patents for which maintenance fees are being paid must include the following:

(i) the patent number

(ii) the patent issue date

(iii) the United States application serial number, and

(iv) the application filing date

(d) Payments of maintenance fees should identify the fee being paid for each patent as to whether it is the 3½, 7½ or 11½ year fee, whether small entity status is being changed or claimed, and the amount of the maintenance fee and any surcharge being paid.

(e) Maintenance fee payments and surcharge payments relating thereto must be submitted separate from any other payments for fees or charges, whether submitted in the manner set forth in §1.23 or by an authorization to charge a deposit account. If maintenance fee and surcharge payments for more than one patent are submitted together, they should be submitted on as few sheets as possible with the patent numbers listed in increasing patent number order. If the payment submitted is insufficient to cover the maintenance fees and surcharges for all the listed patents, the payment will be applied in the order the patents are listed, beginning at the top of the listing.

(f) Notification of any change in status resulting in loss of entitlement to small entity status must be filed in a patent prior to paying, or at the time of paying, the earliest maintenance fee due after the date on which status as a small entity is no longer appropriate. See §1.28(b).

(g) Maintenance fees and surcharges relating thereto will not be refunded except in accordance with §§1.26 and 1.28(a). ◀

10. A new §1.377 is proposed to be added to read as follows:

▶ §1.377 Review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent.

(a) Any patentee who is dissatisfied with the refusal of the Patent and Trademark Office to accept and record a maintenance fee which was filed prior to the expiration of the patent may petition the Commissioner to accept and record the maintenance fee.

(b) Any petition under this section must be filed within 2 months of the action complained of, or within such other time as may be set in the action complained of, and must be accompanied by the fee set forth in §1.17(h). The petition may include a request that the petition fee be refunded if

the refusal to accept and record the maintenance fee is determined to result from an error by the Patent and Trademark Office.

(c) Any petition filed under this section must comply with the requirements of paragraph (b) of §1.181 and must be signed by an attorney or agent registered to practice before the Patent and Trademark Office, or by the patentee, the assignee, or other party in interest. Such petition must be in the form of a verified statement if made by a person not registered to practice before the Patent and Trademark Office. ◀

11. A new §1.378 is proposed to be added to read as follows:

▶ §1.378 Acceptance of delayed payment of maintenance fee in expired patent to reinstate patent based on application filed on or after August 27, 1982.

(a) The Commissioner may accept the payment of any maintenance fee due on a patent based on an application filed on or after August 27, 1982, after expiration of the patent if, upon petition, the delay in payment of the maintenance fee is shown to the satisfaction of the Commissioner to have been unavoidable and if the surcharge required by §1.20(m) is paid as a condition of accepting payment of the maintenance fee. If the Commissioner accepts payment of the maintenance fee upon petition, the patent shall be considered as not having expired, but would be subject to the conditions set forth in 35 U.S.C. 41(c)(2).

(b) Any petition to accept the delayed payment of a maintenance fee filed under paragraph (a) of this section within six months of the expiration of the patent must include:

(1) the required maintenance fee set forth in §1.20(h)-(j);

(2) the surcharge set forth in §1.20(m); and

(3) a showing that the delay was unavoidable since reasonable care was taken to ensure that the maintenance fee would be paid timely. The showing must enumerate the steps taken to ensure timely payment of the maintenance fee.

(c) Any petition to accept the delayed payment of a maintenance fee filed under paragraph (a) of this section more than six months after the expiration of the patent must include:

(1) the required maintenance fee set forth in §1.20(h)-(j);

(2) the surcharge set forth in §1.20(m); and

(3) a showing that the delay was unavoidable since reasonable care was taken to ensure that the maintenance fee would be paid timely and the failure to timely pay the maintenance fee was due entirely to circumstances outside of the control of the patentee. The showing must enumerate the steps taken to ensure timely payment of the maintenance fee and the circumstances which were outside of the control of

the patentee and those acting on behalf of the patentee in paying the maintenance fee. The showing must be sufficient in scope and content to meet the heavy burden of proof required to show that a delay in payment of the maintenance fee of more than six months after expiration of the patent was unavoidable.

(d) Any petition under this section must be signed by an attorney or agent registered to practice before the Patent and Trademark Office, or by the patentee, the assignee, or other party in interest. Such petition must be in the form of a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

(e) Reconsideration of a decision refusing to accept a maintenance fee upon petition filed pursuant to paragraph (a) of this section may be obtained by filing a petition for reconsideration within two months of, or such other time as set in, the decision refusing to accept the delayed payment of the maintenance fee. Any such petition for reconsideration must be accompanied by the petition fee set forth in §1.17(h). After decision on the petition for reconsideration, no further reconsideration or review of the matter will be undertaken by the Commissioner. If the delayed payment of the maintenance fee is not accepted, the maintenance fee and the surcharge set forth in §1.20(m) will be refunded following the decision on the petition for reconsideration, or after the expiration of the time for filing such a petition for reconsideration, if none is filed. The fee set forth in §1.17(h) for filing the petition for reconsideration will not be refunded unless the refusal to accept and record the maintenance fee is determined to result from an error by the Patent and Trademark Office. ◀

April 2, 1984
Date

Commissioner of Patents and Trademarks

(Published as Part V in the Federal Register on April 24, 1984)

PATENT NOTICES

Certificates of Correction for the Week of May 8, 1984

Re. 30,238	4,392,812	4,418,104	4,426,480
Re. 31,136	4,394,321	4,418,105	4,426,503
Re. 31,493	4,394,871	4,418,336	4,426,532
Re. 31,494	4,397,408	4,419,386	4,426,609
D. 261,823	4,397,993	4,419,405	4,427,295
D. 270,276	4,398,513	4,419,453	4,427,492
D. 271,699	4,403,526	4,419,528	4,427,956
4,242,885	4,405,908	4,419,980	4,428,831
4,306,541	4,407,822	4,420,045	4,429,113
4,323,466	4,408,459	4,420,303	4,429,238
4,342,942	4,410,085	4,420,549	4,429,386
4,344,589	4,410,176	4,420,626	4,429,547
4,352,694	4,410,532	4,420,631	4,429,969
4,360,544	4,410,596	4,421,139	4,430,098
4,361,560	4,410,658	4,421,165	4,430,152
4,369,631	4,410,957	4,421,398	4,430,388
4,373,527	4,411,815	4,421,714	4,430,707
4,373,549	4,412,319	4,422,002	4,431,305
4,375,162	4,413,731	4,422,394	4,431,344
4,378,535	4,414,252	4,423,126	4,431,837
4,380,480	4,414,596	4,423,127	4,431,847
4,380,580	4,414,707	4,424,369	4,432,053
4,381,664	4,414,808	4,424,487	4,432,111
4,381,867	4,415,064	4,424,721	4,432,326
4,387,272	4,415,190	4,424,806	4,432,451
4,388,2 60	4,415,433	4,425,230	4,432,505
4,389,614	4,415,506	4,425,306	4,432,631
4,389,970	4,416,864	4,425,776	4,432,882
4,390,779	4,416,937	4,425,954	4,433,855
4,391,207	4,417,326	4,425,995	4,434,059
4,392,286	4,417,705	4,426,454	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public L ibrary	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis—Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 704-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF March 31, 1984

PATENT EXAMINING GROUPS	Actual Filing Date of Action New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	10-28-82
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	5-12-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	9-30-82
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-18-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director	3-22-82
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	6-01-81
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-24-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	7-19-82
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	1-26-81
DESIGN, GROUP 290—K. L. CAGE, Director	1-14-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	3-16-82
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	6-10-82
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	11-04-76
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	5-14-82
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	7-23-81

Expiration of patents: The patents within the range of numbers indicated below expire during March 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,307,200 to 3,311,920, inclusive

Plant Patents ..... Numbers 2,723 to 2,729 inclusive

REISSUES

MAY 8, 1984

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,581

APPARATUS FOR DETECTING FORCES DIRECTING THE MOVEMENT OF A MANIPULATING INSTRUMENT

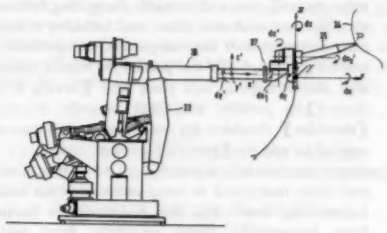
Hans Richter, Augsburg, Fed. Rep. of Germany, assignor to Gesellschaft fur digitale Automation mbH, Munich, Fed. Rep. of Germany

Original No. 4,298,308, dated Nov. 3, 1981, Ser. No. 78,280, Sep. 24, 1979. Application for reissue Aug. 6, 1982, Ser. No. 405,779

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1978, 2841284

Int. Cl.³ G05B *19/42*; B25J *9/00*

U.S. Cl. 414—730 **33 Claims**



1. In combination with a motor driven manipulating arm capable of movement along mutually perpendicular axes, an apparatus for programming said manipulating arm to precisely repeat a sequence of movements, said apparatus comprising:

a handle assembly including a center part rigidly attached to said manipulating arm for joint movement therewith, said handle assembly further including an outer sleeve portion surrounding said center part;

flexible coupling means for joining said outer sleeve to said center part while allowing limited relative movement therebetween; and,

data transducer means mounted on said handle assembly for detecting forces acting on said outer sleeve and generating output signals indicative of the magnitude and direction of said forces, whereby said signals are employed to create a playback program directing said motor driven manipulating arm to repeatedly perform the same sequence of movements.

Re. 31,582

AUTOMATIC CONTROL SYSTEM FOR METHOD AND APPARATUS FOR CHECKING DEVICES OF AN AUTOMOTIVE VEHICLE IN USE WITH A MICROCOMPUTER

Akio Hosaka, Yokohama, and Kazuhiro Higashiyama, Atsugi, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Original No. 4,339,801, dated Jul. 13, 1982, Ser. No. 132,647, Mar. 21, 1980. Application for reissue Sep. 29, 1982, Ser. No. 424,628

Claims priority, application Japan, Mar. 23, 1979, 54-33880

Int. Cl.³ G06F *11/00*

U.S. Cl. 364—431.04 **9 Claims**

1. In a control system for an automotive vehicle for controlling various devices in response to sensor signals fed from sensors, said system having a microcomputer for receiving and processing said sensor signals and for controlling said devices, said microcomputer including an input unit, an output unit, a CPU, and a memory storage device including a ROM and a RAM, a method of controlling said vehicle and checking operation of said microcomputer comprising steps of:

(a) operating a control program in said microcomputer in response to said sensor signals for controlling said vehicle devices,

(b) determining in said CPU and in response to said sensor signals at least a first and a second engine condition,

(c) in response to said first determined engine condition, operating a first checking program for checking operation of said memory storage device, operation of said first checking program including the steps of:

(i) in said RAM, feeding into said RAM a first plurality of data signals corresponding to a first set a data values,

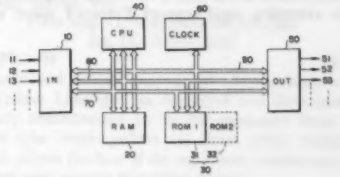
(ii) reading out of said RAM said fed-in data signals,

(iii) comparing each of said read out data signals with each of said first plurality of data signals and generating a first error signal upon non-equivalence of same,

(iv) providing an indication of said first error signal,

(v) in said ROM, reading a second plurality of data values from storage locations of said ROM,

(vi) comparing at least the least significant bits of the sum of said read data values with a reference sum and generating a second error signal upon non-equivalence thereof,



(vii) providing an indication of said second error signal,

(d) in response to said second determined engine condition, operating a second checking program for checking operation of at least one of said input and output units, said second checking [progrom] *program* including the steps of:

(i) for said input unit, feeding into said input unit a third plurality of data signals corresponding to a third set of data values,

(ii) comparing in said CPU said third set of data values with one set of reference values stored in said memory storage device,

(iii) generating a third error signal if each of said third set of data values is not equal to each of said one set of reference values,

(iv) providing an indication of said third error signal,

(v) for said output unit, feeding a fourth plurality of data signals corresponding to a fourth set of data values from said memory device to said output unit,

(vi) comparing said fourth set of data values with another set of reference values,

(vii) generating a fourth error signal if each of said a fourth set of data values is not equal to each of said other set of reference values, and

(viii) providing an indication of said fourth error signal.

Re. 31,583

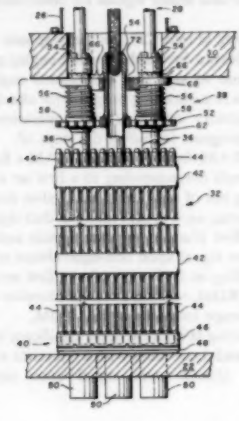
FUEL ASSEMBLY HOLD-DOWN DEVICE

Ralph H. Klumb, Simsbury, and John J. Hutchinson, Windsor, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Original No. 3,770,583, dated Nov. 6, 1973, Ser. No. 145,374, May 20, 1971. Application for reissue Dec. 29, 1980, Ser. No. 220,591

Int. Cl.³ G21C *19/02*

U.S. Cl. 376—364 4 Claims



1. In a nuclear fuel assembly including, *a plurality of* longitudinally extending rigid support [means] *tubes*; upper and lower end fittings supported by said support [means] *tubes* at opposite ends thereof; a plurality of elongated fuel elements in parallel relationship and extending substantially between said upper and lower end fittings and supported by said support [means] *tubes*, hold-down apparatus for said fuel assembly in which said upper end fitting comprises:

an end plate supported by said support [means] *tubes* against downward motion relative thereto and extending transversely thereof;

[alignment means] *a plurality of hollow cylindrical posts* projecting longitudinally upward from and supported against upward motion relative to said end plate, *each of* said [alignment means] *posts* having an outwardly enlarged shoulder affixed thereto and spaced upwardly from said end plate[;], *said posts and end plate including passageways extending vertically therethrough in registry with said tubes whereby a control element may be inserted therewithin into said fuel assembly;*

force transmitting means slidably mounted on said [alignment means] *posts* and movable therealong between said shoulder and said end plate, *and including a hold-down plate having at least one hub portion, an aperture in and extending through said hub portion for relative slidable passage therethrough of said posts,* and [having a portion thereof] *leg portions* extending laterally beyond said [shoulder] *shoulders* for receiving a downward force applied to said *leg* [portion] *portions*; and

spring means *coaxially disposed about a plurality of said posts and being* interposed *in compression* between said force transmitting means and said end plate for biasing said force transmitting means upwardly from said plate whereby a said downward force on said force transmitting means is yieldably transmitted to said fuel assembly.

PLANT PATENTS

GRANTED MAY 8, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,228

NECTARINE TREE—2W68C

Chris F. Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351

Filed Dec. 13, 1982, Ser. No. 439,223

Int. Cl.³ A01H *5/03*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree of large size, upright growth and a regular and productive bearer of large, yellow flesh, clingstone fruit with excellent eating and shipping quality and the tree is further characterized by the uniform distribution of large size fruit throughout the tree with relatively uniform ripening of the fruit, ripening 3 to 4 days later than Zee Gold nectarine (U.S. Plant Pat. No. 3,087).

5,229

LEUCOTHOE PLANT—ZEBONARD VARIETY

Alex J. Zebehazy, Perry, Ohio, assignor to Conard-Pyle Company, West Grove, Pa.

Filed Jun. 22, 1981, Ser. No. 276,062

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—54 **1 Claim**

1. A new and distinct variety of Leucothoe substantially as herein shown and described, characterized particularly as to novelty by the unique combination of:

(a) a dense, compact, symmetrical habit of growth which is much more attractive and compact than that of the *Leucothoe fontanesiana* parent,

(b) highly unique winter coloration which ranges from green to a greenish bronze making the new variety an outstanding source of color in the landscape year-round,

(c) outstanding tolerance to shade, making the new variety an important addition to that small group of plants that does well in reduced sunlight,

(d) the substantial absence of dead branches which are commonly found with *Leucothoe fontanesiana,*

(e) increased tolerance to cold when compared to *Leucothoe axillaris,* as is evidenced by the fact that the new variety has survived temperatures of −15° F. with little to no damage, whereas *Leucothoe axillaris* is listed as hardy to 0° F., and

(f) foliage which is considerably smaller and less lanceolate, as well as winter foliage which is considerably less glossy and of a darker coloration than that of the Zeblid variety of the same cross.

5,230

CHRYSANTHEMUM PLANT NAMED YELLOW LIMELIGHT

Peter S. Hesse, Bradenton, Fla., assignor to Pan American Plant Company, Parrish, Fla.

Filed Aug. 11, 1982, Ser. No. 407,102

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of chrysanthemum plant named Yellow Limelight, as described and illustrated, and particularly characterized by its flat capitulum form, daisy capitulum type, bright yellow ray floret color, diameter of 35–40 mm. across the face of the capitulum, medium pot plant height, and semi-upright branching pattern.

PATENTS

GRANTED MAY 8, 1984

ERRATA

For CLASS	See PATENT NO.
346–213	4,447,075
358–075	4,447,113
346–200	4,447,487
329–126	4,447,772
328–233	4,447,773
328–150	4,447,774
324–438	4,447,775
324–253	4,447,776
324–220	4,447,777
324–213	4,447,778
324–207	4,447,779
324–132	4,447,780
324–083	4,447,781
324–056	4,447,782
323–275	4,447,783
323–226	4,447,784
320–025	4,447,785
377–055	4,447,798
343–783	4,447,811
091–369	4,447,897

PATENTS

GRANTED MAY 8, 1984

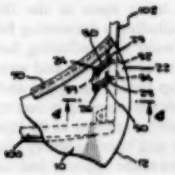
REISSUE

PATENTS

GRANTED MAY 8, 1984

GENERAL AND MECHANICAL

4,446,571
VISOR
Gary Ross, 1128 24th St., Apt. B, Santa Monica, Calif. 90403
Filed Nov. 27, 1981, Ser. No. 325,334
Int. Cl.³ A61F 9/04
U.S. Cl. 2—13 4 Claims



1. An improved visor comprising:
a. a flat body portion in the shape of an arcuate partial disc containing an upper surface, a lower surface, a curved forward edge and a curved rear edge;
b. four left holes extending transversely through the body portion and located adjacent the left rear corner of said flat body portion so as to form a pair of left outer holes and a pair of left inner holes;
c. four right holes extending transversely through the body portion and located adjacent the right rear corner of said flat body portion so as to form a pair of right outer holes and a pair of right inner holes;
d. a left elastic attaching means extending through said four left holes so as to form a pair of left receiving loops extending through said pair of left outer holes and extending from the lower surface of the improved visor; and
e. a right elastic attaching means extending through such four right holes so as to form a pair of right receiving loops extending through said pair of right outer holes and extending from the lower surface of the improved visor;
f. whereby the improved visor can be removably attached to a pair of eyeglasses by placing the left temple of the eyeglasses through the left pair of receiving loops and by placing the right temple of the eyeglasses through the right pair of receiving loops and whereby the tension on the temples can be adjusted by pulling on the portion of the left attaching means extending through the left inner holes and by pulling on the portion of the right attaching means extending through the pair of right inner holes.

4,446,572
CAMOUFLAGED NURSING DRESS
Rosaland O. Lindquist, 4084 W. 7th St., Los Angeles, Calif. 90005
Filed Aug. 12, 1983, Ser. No. 522,809
Int. Cl.³ A41D 1/20
U.S. Cl. 2—104 3 Claims

1. A camouflaged nursing dress, including, in combination:
(a) an outer dress portion covering the torso and of a given color and design;
(b) an under dress portion covering the front of the torso from the inside upper front margin of the outer dress portion and extending downwardly over the top areas of the breasts to within a short distance of the nipples and of the same color and design as said outer dress portion;
(c) attachment means securing the shoulders and side arm portions of the under dress portion to corresponding parts of the inside of the outer dress portion; and
(d) exposing means on the front of said outer dress portion for removing an area of said outer dress portion from in front of the torso to expose said under dress portion and uncovered areas of the breasts for nursing a child, the same color and design on the under dress portion blending in with the remaining front of the outer dress portion to camouflage the fact that an area of the outer dress portion has been removed.

4,446,573
TROUSERS HAVING MODIFIED POCKET
William M. Green, P.O. Box 387, Acme, Mich. 49610
Filed Nov. 22, 1982, Ser. No. 443,858
Int. Cl.³ A41D 27/20
U.S. Cl. 2—252 15 Claims

1. In a pair of trousers having front and rear portions defining a waist portion and a pair of trouser leg members, said rear portions being provided with a hip portion disposed between said waist portion and said leg members, wherein the improvement comprises:
pocket means having cover portion disposed on said hip portion to define a first opening along the top of said pocket for accessing the interior of said pocket;
said hip portion defining a second opening communicating with the interior of said trousers between said front and rear portions, said second opening being completely covered by said cover portion of said pocket means and communicating directly with the interior of said pocket.

4,446,574
BELTS WITH CONCEALED POCKETS
Mary Kalomeris, 303 W. 66th St., New York, N.Y. 10023
Filed Apr. 29, 1982, Ser. No. 373,192
Int. Cl.³ A41F 19/00; A41D 27/20
U.S. Cl. 2—338 6 Claims

1. Belt apparatus comprising a decorative facial shell of soft pliable material having similarly curved upper and lower edges and having inward tapered first and second opposite ends, thereby forming a general crescent shape, the belt having parallel stitches extending between the first and second opposite ends generally parallel to upper and lower edges and closer to the upper edge than the lower edge for preventing stretching of a mid-portion of the belt and promoting desired drape of

the belt when worn, a pocket having curvilinear upper and lower edges curved similar to upper and lower edges of the belt and having opposite first and second lateral edges generally perpendicular to upper and lower curvilinear edges at positions of intersection therewith, whereby the lateral edges generally lie along radii of the curvilinear upper and lower edges, the pocket being formed of an outer face and a backing of similar size and shape stitched together along opposite lateral edges, the outer face of the pocket having an elongated opening therein spaced slightly downward from the upper edge thereof, and a side fastener positioned inside the opening and stitched to the opening along edges thereof, whereby the opening is selectively closed and opened by moving a slide on

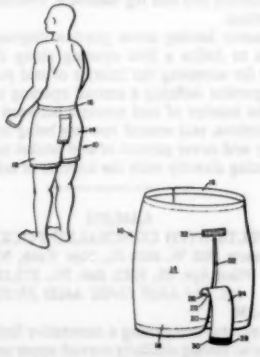
the slide fastener along the opening, the upper and lower edges of the belt being rolled inward about upper and lower edges of the pocket and stitches securing the inward rolled position of the edges of the belt and securing upper and lower edges of the pocket within the inward rolled upper and lower edges of the belt, a buckle having first and second openings separated by a cross-piece, the buckle being secured to the belt by passing one tapered end out through one opening in the buckle, around the cross-piece and back through the second opening in the buckle and securing the tapered end to an inside of the belt, whereby the second end may be secured to the buckle by passing the second tapered end outward through the second opening in the buckle, around the cross-piece and inward through the first opening in the buckle.

4,446,575

HOSPITAL SHORTS

Glenn R. Davis, 1213 Randy, Irving, Tex. 75060

Filed Sep. 28, 1981, Ser. No. 306,488
Int. Cl.³ A41B 9/00
U.S. Cl. 2—400 **3 Claims**



1. Shorts adapted for use by patients undergoing proctological examination and treatment to protect the patient's privacy without interfering with examination or treatment, comprising:

a pair of trunks having front and rear portions joined together at a crotch and including a waistband and having identical leg portions extending from said front and back portions below said crotch a distance substantially above the patient's knee;

said rear portion having an elongated opening centrally thereof extending from a point spaced below said waistband to a point rearwardly of and spaced above said crotch to provide access through said opening to the patient's anal region for examination or treatment;

said front and rear portions further being dimensioned to gather below said waistband so that access through said opening is not interfered with by said shorts;

said waistband being open at the front central portion thereof and including a drawstring for adjusting the fit at the patient's waist and including fasteners at said front central portion for fastening said waistband; and

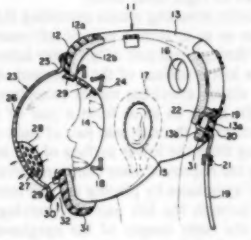
a rectangular flap having an upper and lower end, dimensioned to cover said opening in said rear portion, said flap being permanently secured at its lower end to said rear portion below said opening above said crotch and having fastening means at the opposite end thereof for removably fastening said upper end portion to said rear portion above said opening for covering said opening with said flap.

4,446,576

SAFE GUARD PROTECTIVE EQUIPMENT FOR FIGHTING ART

Masauki Hisataka, 20, Kikui-cho, Shinjuku-ku, Tokyo, 162, Japan

Filed Nov. 2, 1981, Ser. No. 317,254
Claims priority, application Japan, Nov. 17, 1980, 55-165351
Int. Cl.³ A42B 3/00
U.S. Cl. 2—425 **8 Claims**



1. Safe guard protective equipment for protecting a wearer engaged in the fighting arts comprising:

a cover body integrally formed with an upper front portion to cover the brow and a lower front portion to cover the chin of said wearer and side portions extending across the side and rear of said wearers head, said cover body being composed of a tough armored exterior member formed of shock-resistant material of relatively high hardness having bonded thereto a resilient lining member formed of relatively soft material having high foaming magnefication and high adaptability to the face and head;

a spherical shaped protective mask of transparent highly shock-resistant material having a flange shaped peripheral portion conforming to the shape of the front of said cover body and fixedly secured thereto, said protective mask providing a central viewing window and being formed with a thickened portion in the lower half having a plurality of small vent holes therethrough for passage of said wearer's breath and with a plurality of ventilating windows positioned in the upper and lower portions of the outer periphery so as not to affect the field of view of said wearer; and

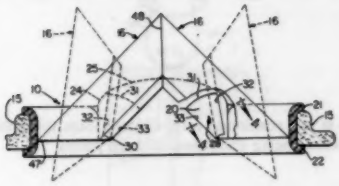
fastening means arranged at the rear ends of said cover body side portions for securing said ends about said wearers head.

4,446,577

ARTIFICIAL HEART VALVE

Louis C. Meyer, Denver, Colo., and Samuel H. Goodenough, Dana Point, Calif., assignors to Mitral Medical International, Inc., Wheat Ridge, Colo.

Continuation-in-part of Ser. No. 144,034, Apr. 28, 1980, abandoned. This application Dec. 8, 1980, Ser. No. 213,944
Int. Cl.³ A61F 1/22
U.S. Cl. 3—1.5 23 Claims



1. In an artificial heart valve wherein at least one occluder leaflet is disposed for swinging movement within a generally annular valve body, said leaflet having opposed leading and trailing edge surfaces, and a pair of axially directed extensions are disposed at spaced circumferential intervals on said valve body and extend in a downstream direction from said valve body, each extension including a shallow recess having opposed sidewalls diverging away from one another in a downstream direction, the improvement comprising:

said occluder leaflet having a major wall portion of generally elliptical configuration terminating on opposite sides in flat portions extending in opposite directions to one another and normal to said axially directed extensions, said flat portions provided with lateral edge surfaces defining opposite lateral margins of said leaflet, guide means mounting said leaflet for movement between a closed position extending across the central opening in said valve body and an open position extending substantially parallel to and relatively near said valve body and spaced away from the axis of said valve body, said guide means defined by lateral projections disposed on opposed lateral edge surfaces of said leaflet, said lateral projections aligned with and inserted into said recesses on said extensions, each lateral projection being of a width less than the space between said sidewalls, each pair of lateral projections for a leaflet being operative to control combined pivotal and translatory movement of said leaflet between said open and closed positions.

4,446,578

JOINT TREATMENT

Ezra C. Perkins, 10950 Temple Ter., Apt. 719, Seminole, Fla. 33542, and Ronald G. Connolly, 2401 Pennsylvania Ave., Wilmington, Del. 19806

Filed Mar. 8, 1982, Ser. No. 355,872
Int. Cl.³ A61F 1/24, 1/00
U.S. Cl. 3—1.91 7 Claims

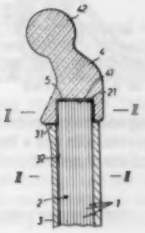
2. The treatment of a bone joint having defective cartilage between the bone ends, which treatment is characterized by the injecting into the joint without surgery, a liquid that is subsequently converted into a cushioning pad between the bone ends.

4,446,579

FLEXIBLE CERAMIC BIO-IMPLANT MEMBER

Kazuo Inamori, Kyoto, and Masaya Hirabayashi, Yokaichi, both of Japan, assignors to Kyocera Corporation, Kyoto, Japan

Continuation of Ser. No. 100,059, Dec. 4, 1979, abandoned. This application Apr. 16, 1982, Ser. No. 369,171
Claims priority, application Japan, Dec. 4, 1978, 53-150401
Int. Cl.³ A61F 1/24, 5/04; A61B 17/18; A61C 13/30
U.S. Cl. 3—1.91 14 Claims



1. A flexible bio-implant member comprising a bundled body of a plurality of longitudinally arranged fibers having flexibility and elasticity and bundled into a desired shape in the state of the fibers being allowed to make flexible movement, wherein the length of each fiber extends in substantially the same longitudinal direction and said fiber bundled body is adapted for permanent insertion into the bone of a living body to be joined or redintegrated by the bio-implant member, wherein the fibers are arranged to define gaps therebetween which are sufficiently small so that new bone tissue will grow in the gaps and wherein the fibers have sufficient length so that they extend across a joint portion of the bone to be joined or redintegrated.

4,446,580

PROSTHETIC FOOT STRUCTURE

Koutaro Furuya, Tokyo; Kazuho Hosoda, Saitama; Takahito Takeuchi, Tokyo; Yasuyuki Ishikura, Tokyo, and Morihiro Kameda, Tokyo, all of Japan, assignors to Keiai Orthopedic Appliance Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1981, Ser. No. 272,067
Int. Cl.³ A61F 1/08
U.S. Cl. 3—6 5 Claims

1. A foot section of an artificial limb comprising:

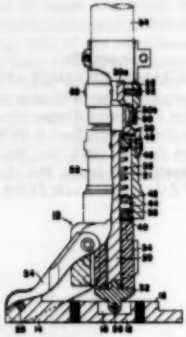
(a) a horizontal base member having a longitudinal axis defining thereon a forward projection, a heel portion, and a first pivot axis, said forward projection having a second pivot axis at a forward end wherein said first and said second pivot axes are horizontally perpendicular to said longitudinal axis;

(b) a housing having a cylindrical portion and pivotally connected to an arm extending therefrom to said base member at said second pivot axis forming an ankle axis of the foot section;

(c) a shaft pivotally connected to said base member at said first pivot axis and extending coaxially through a resilient member mounted to said housing thereby permitting said housing to incline about said second pivot axis toward said forward projection;

(d) said resilient member includes a first bumper which is compressed upon inclining of said housing toward said forward projection, and a second bumper for effecting absorption of compressive forces added to the heel por-

tion of the foot section so that a smooth walking phase can be achieved; and



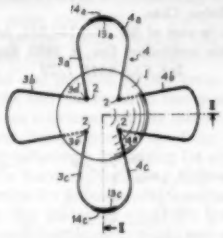
(e) wherein said second pivot lies on a line which is intermediate the first pivotal axis and a line corresponding to the foremost part of the plantar arc of a human foot.

4,446,581
INTRAOCULAR LENS WITH FREE-ENDED SIZING PRONG
Larry W. Blake, 2885 Regis La., Costa Mesa, Calif. 92626
Filed Sep. 2, 1981, Ser. No. 298,464
Int. Cl.³ A61F 1/16, 1/24
U.S. Cl. 3—13 **29 Claims**

1. An intraocular lens comprising: a lens; and a compressible sizing prong having one end connected to the lens and having an opposite free end; and a preformed coil spring section in the prong intermediate its ends, which coil spring section has a closed coil structure when the prong is in its natural uncompressed state prior to surgical implantation.

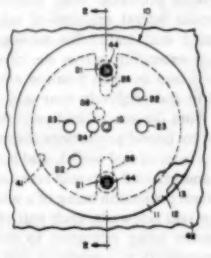
4,446,582
INTRA-OCULAR IMPLANT
Khalil Hanna, 5, rue Montmartre, Paris, France (75001)
Filed Jun. 7, 1982, Ser. No. 386,202
Claims priority, application France, Jun. 16, 1981, 81 11842
Int. Cl.³ A61F 1/16, 1/24
U.S. Cl. 3—13 **11 Claims**

1. In an intra-ocular implant forming artificial lens constituted by a glass lens and at least one pair of front loops for fixation thereof starting substantially radially from the lens, each of said loops being constituted by a filiform element, said loop is constituted by two portions of elastic wire curved towards each other in their final portion, so that their ends



overlap in rest position to form a closed loop, the ends of said final portions being sharpened to sharp points.

4,446,583
ADJUSTABLE TOOL FOR TUB OVERFLOW
David F. Dean, 75 Berkeley St., Rochester, N.Y. 14607
Filed Jun. 28, 1982, Ser. No. 392,746
Int. Cl.³ E03C 1/24
U.S. Cl. 4—206 **10 Claims**



1. An adjustable tool disposed to be releasably secured over and to seal any one of a variety of different types of tub overflow openings during the plunging of an associated tub drain, comprising

a first rigid member having therethrough a pair of spaced, elongate openings registrable selectively with any one of a plurality of pairs of differently spaced mounting lugs on different tub overflows,

a second rigid member having therethrough a plurality of angularly spaced pairs of circular openings, each of said pairs of circular openings also being registrable selectively with one of said pairs of spaced mounting lugs, and

means connecting said members together for adjustment relative to each other into any one of a first plurality of different operating positions in each of which one only of said pairs of circular openings in said second member registers with said elongate openings in said first member,

one of said members having a layer of resilient material secured to the side thereof opposite the other member, and having therethrough a plurality of openings similar to, and registering with, the openings in said one member.

4,446,584

HEATED TOILET SEAT

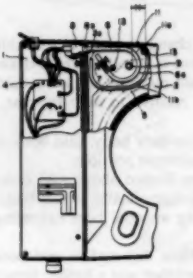
Koichi Suzuki, Chiryu; Mikio Yoshihara, Kariya; Shinji Kawai, and Katsuhiro Mori, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 20, 1982, Ser. No. 435,465

Claims priority, application Japan, Oct. 22, 1981, 56-157780[U]; Dec. 21, 1981, 56-190490[U]; Dec. 21, 1981, 56-190491[U]; Dec. 21, 1981, 56-190492[U]; Dec. 21, 1981, 56-190493[U]; Dec. 21, 1981, 56-190494[U]

Int. Cl.³ A47K *13/30*

U.S. Cl. 4—237 8 Claims



1. An apparatus for accommodating an electrical cord in a heated toilet seat which comprises a toilet seat body having a hollow interior portion and a heater, a base cover having control means for controlling the heater, and an electrical cord for electrically interconnecting the heater and the control means, said toilet seat body being connected to said base cover for pivoting through a predetermined angle, wherein said base cover is provided with a hole, a grommet fitted within said hole, and one end of said electrical cord is tightly secured within said grommet, and wherein the other end of said electrical cord is fixed within the hollow interior portion of said toilet seat body and has a slack portion in the shape of a loop accommodated within said hollow interior portion, said electrical cord extending from said hollow interior portion to take up the slack when said toilet seat body is pivoted in an opening direction, said electrical cord retracting into said hollow interior portion to form said slack when said toilet seat body is pivoted in a closing direction, and a guide stopper affixed within said hollow interior portion and positioned within said loop for guiding said electrical cord during the extension and retraction thereof.

4,446,585

PORTABLE TOILET

George W. Harding, Clearwater, Fla., and Ronald E. Sears, Bloomfield Hills, Mich., assignors to Sani-Jon Mfg., Inc., Troy, Mich.

Filed Jan. 22, 1982, Ser. No. 341,731

Int. Cl.³ A47K *11/02*

U.S. Cl. 4—460 3 Claims

1. A portable toilet comprising:

a plurality of unitary upright plastic walls, each wall being formed with reinforcement ribs and having an outer major face, four walls forming a structure of rectangular horizontal cross section with one wall having a door therein, and the structure having a roof, each vertical edge of the walls having a flange portion bent inwardly at about 90° angle from said outer major face of its respective wall, each of said vertical edges terminating in an outer end portion bent at about a 90° angle with respect to the flange portion thereby projecting parallel to and inwardly of said major face of its respective wall;

W-shaped metal corner posts having outer and intermediate plate portions generally conforming to the flange and outer end portions of the walls, respectively; said intermediate plate portions extending at 90° to each other and joined by a flat apex;

fastening means connecting the flange portions of said walls to the outer plates of said corner posts inboard of said structure;

an elongated V-shaped cover secured to the corner posts outboard of said structure by a fastening means extending through said apex, said cover covering the end portions of said walls;

said structure housing an effluent holding tank, a urinal emptying therein and a toilet seat giving access to said tank;

whereby the corners of the structure are indented to protect them from physical damage and the walls are secured to the corner posts in such manner so as to minimize shear forces on the fastening means when the walls flex.

4,446,586

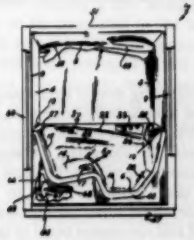
APPARATUS AND METHOD FOR BATHING INVALIDS

Stewart D. Reed, El Toro, Calif.; Arthur A. Sills, Traverse City, Mich.; John H. Kraft, Traverse City, Mich.; Raymond T. Houle, Traverse City, Mich.; Michael A. Redwine, Acme, Mich., and Fredrick A. Kilborn, Suttons Bay, Mich., assignors to Silchor, Traverse City, Mich.

Division of Ser. No. 187,522, Sep. 15, 1980, Pat. No. 4,346,485. This application May 20, 1982, Ser. No. 380,058

Int. Cl.³ A47K *3/02, 3/08*

U.S. Cl. 4—555 18 Claims



1. A combination shower and bath unit, comprising:

an enclosure including a bathtub with walls upstanding from both ends and a rearward side thereof to form a stall;

said bathtub having a raised seat portion, a back portion extending generally upwardly from said seat portion, and a foot portion disposed below and forwardly of said seat portion; said seat, back and foot portions having an anatomical contour which forms a chair shape for supporting an invalid in a seated position in the unit;

said bathtub having a lateral opening in one side thereof with sufficient size to permit invalid ingress and egress therethrough, and being oriented substantially parallel with the sides of said seat portion;

a door selectively closing said bathtub opening;

means for forming a seal between said door and said bathtub when said door is in a closed position which is leakproof when said bathtub is filled with water to a level substan-

tially above a base portion of said opening for immersal bathing of an invalid;

at least one shower head mounted on one of said stall walls and oriented toward the seated invalid, whereby said unit is capable of both immersal bathing and showering the invalid for hygiene and therapy;

a pair of tracks supported on said stall end walls at opposing sides of said door, and extending vertically upwardly above said bathtub and rearwardly along ghe upper edges of said stall end wall over said bathtub; and

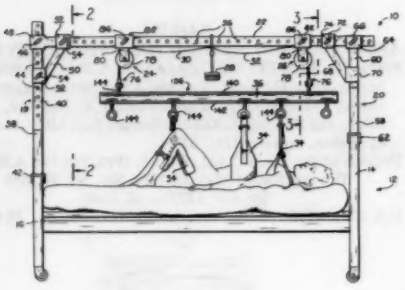
means for slideably mounting said door on said tracks for translating said door vertically into the closed position, and rotating said door as it is raised from the closed position into a substantially horizontal, overhead storage position directly over said bathtub.

4,446,587

PATIENT POSITIONING DEVICE

Clarence E. Jump, 1085 Tasman Dr. #208, Sunnyvale, Calif. 94086

Filed Jul. 28, 1981, Ser. No. 287,627
Int. Cl.³ A47G *7/10*
U.S. Cl. 5—83 **7 Claims**



1. A patient positioning device comprising:

(a) an elongated, substantially horizontal, suspension means including a first, upright support means, a second upright support means, an elongated, substantially horizontal suspension beam, a vertical adjustment means coupling a first end of said suspension beam to said first support means, and horizontal adjustment means for attaching said second end of said suspension beam to said second support means;

(b) a first vertical lift means coupled to said suspension means, and a second vertical lift means coupled to said suspension means;

(c) motor means coupled to said first vertical lift means and to said second vertical lift means;

(d) a motor controller means coupled to said motor means and operative to independently control said first vertical lift means and said second vertical lift means; and

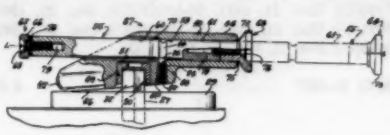
(e) a body portion support means coupled to at least one of said first vertical lift means and said second vertical lift means, whereby a portion of a patient's body may be selectively raised under the control of said motor control means, said body portion support means including a rigid, contoured, saddle shaped member having a pair of thigh receptive recesses on a first side, and a diverging pair of calf receptive recesses on a second side, whereby a patient's legs can be lifted in a bent-kneed, spread legged position.

4,446,588

MULTI-PURPOSE TOOL

Richard J. Garcia, 304 Plum Dr., Exeter, Calif. 93221

Filed May 24, 1982, Ser. No. 381,545
Int. Cl.³ B23Q *11/00*; B25F *1/00*
U.S. Cl. 7—138 **9 Claims**



1. For use in changing a tool in a machine having a drawbar for holding a tool in a collet, which drawbar has an end protruding from said machine and is rotatable to release and secure the collet relative to said drawbar; a combination tool comprising

an elongated unitary body, said body being formed with a broad protuberant portion;

a grip portion formed above said protuberant portion and extending longitudinally of said body;

means defining an axial bore extending through said grip portion;

a handle slidably disposed in said bore between a handle extended position and a handle retracted position;

a flat surface being formed on an extremity of said protuberant portion remote from said grip portion;

means defining a recess extending inwardly from said flat surface;

a receptacle disposed in said recess and affixed therein; said receptacle conforming to the exterior shape of the drawbar and adapted to fit in mating engagement over the protruding end thereof to rotate the same upon rotation of said tool;

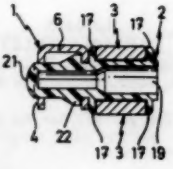
and said flat surface defining with said protuberant portion, a mallet for striking the top of said drawbar to thereby free the collet.

4,446,589

WIPER BLADE AND LATERAL CONNECTOR

Giuseppe A. Maiocco, Rivoli, Italy, assignor to Champion Spark Plug Italiana, S.p.A., Druento, Italy

Filed May 19, 1982, Ser. No. 379,656
Claims priority, application Italy, Jun. 9, 1981, 67789 A/81
Int. Cl.³ B60S *1/40*
U.S. Cl. 15—250.32 **9 Claims**



1. A wiper blade bridge of which the cross section is substantially U-shaped and a connector for attaching thereto a wiper arm, characterized in that each of the two side walls of the U-shaped bridge has a circular opening provided with two opposed extensions and that the connector has a wiper arm connecting portion and a wiper blade connecting portion extending transversely to the arm connecting portion, the blade connecting portion comprises a cylindrical pivot pin provided with two radially outwardly extending opposed stops corresponding to said extensions of said circular openings of the U-shaped bridge, the pin extending through the openings in the side walls and the stops engaging the inside of the side wall adjacent the arm connecting portion as the connector and

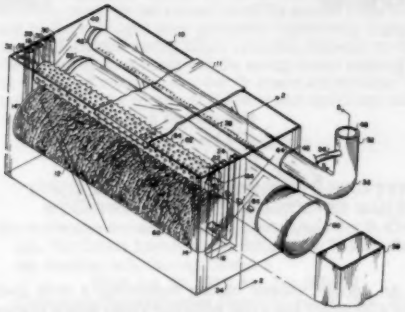
wiper arm pivot relative to the wiper blade when the arm and blade are in a windshield wiping position.

4,446,590

PAINT ROLLER CLEANER

Charles H. Kirchner, Jr., 2013 Wrenwood Dr., Huntsville, Ala. 35803, and Thomas K. McDonald, 2200 Gladstone Dr., Huntsville, Ala. 35811

Filed Feb. 25, 1982, Ser. No. 352,319
Int. Cl.³ B08B *3/02*
U.S. Cl. 15—302 **10 Claims**



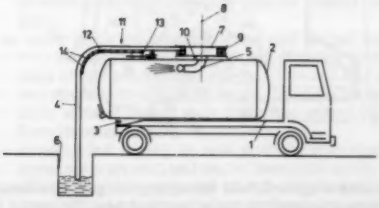
1. A paint roller cleaner comprising:
a frame;
support means for removably and pivotally supporting ends of a paint roller, said roller including two spindles positionable within and on said frame and along an axis of a given direction;
a longitudinal manifold supported on said frame and extending generally parallel with said axis and spaced therefrom, and said manifold having a series of openings along a longitudinal side of said manifold facing in a direction which will be intercepted by an off-axis line of position on the paint roller as positioned in said support means;
mounting means for mounting said longitudinal manifold on said frame, and including means for adjustably rotating said longitudinal manifold with respect to said frame about a longitudinal axis;
supply means for supplying a flow of water under pressure to said longitudinal manifold; and
positioning means for variably positioning said support means with respect to said longitudinal manifold.

4,446,591

VEHICLE FOR CLEARING MATERIAL FROM DRAINS AND THE LIKE

Karl Wiedemann, Haldenloh 2 a, 8901 Welden, Fed. Rep. of Germany

Filed Apr. 23, 1982, Ser. No. 371,177
Int. Cl.³ B08B *3/02, 9/04*
U.S. Cl. 15—315 **10 Claims**



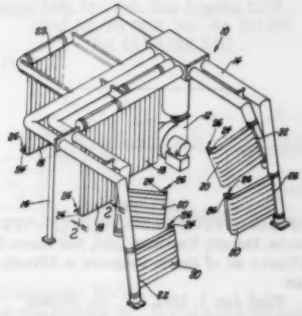
1. A tank vehicle for cleaning drains and cesspools by aspiration, having a tank, a reel, a flexible pipe designed to be coiled up on said reel, said pipe being joined with said vehicle's tank for aspiration, said reel having, at least during an aspiration operation, an upright axis with said pipe placed in horizontal turns about it.

4,446,592

NOZZLE ASSEMBLY

Lucian G. McElroy, 3315 Brocker Rd., Metamora, Mich. 48455

Filed Sep. 28, 1982, Ser. No. 425,686
Int. Cl.³ B08B *1/00*
U.S. Cl. 15—316 R **6 Claims**



1. A nozzle assembly (26) to be connected to an outlet (24) of a bag (18,20) having a substantially rectangular cross section of an apparatus (10) for emitting a stream of air under pressure therethrough to remove fluid from the surface of a vehicle, said assembly (26) comprising: an elongated body portion being substantially rectangular when viewed in cross section; an outlet portion (36) defining a first elongated opening (37) and being adapted to be connected to the bag outlet (24); a nozzle portion (38) defining a second opening (40) having a smaller area than said first opening (37); and characterized by a plurality of rollers (50), support means being integral with said nozzle portion (38) and extending therefrom for supporting said rollers (50) longitudinally along said nozzle portion (38), connecting means for connecting said rollers (50) to said support means, said support means including a plurality of integral projections (52) extending from said nozzle portion (38), each of said projections (52) having a bore therethrough being aligned with the remaining ones of said bores to define an axis, said connecting means including a rod (54) for supporting said rollers (50), said rod (54) being disposed through said bores and each of said rollers (50) being mounted on said rod (54) between a pair of said projections (52).

4,446,593

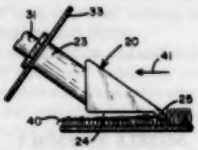
CARPET STEAMING TOOL

Dwain C. Bell; Lloyd E. Anderson, and Martin L. Anderson, all of Minneapolis, Minn., assignors to National Carpet Jobbers, Inc., Minneapolis, Minn.

Filed Jan. 18, 1982, Ser. No. 340,243
Int. Cl.³ B08B *3/00*
U.S. Cl. 15—322 **7 Claims**

1. A carpet steaming tool comprising an elongated steam plenum having a generally flat outer surface, means for admitting steam to said plenum, dispensing means positioned along

said surface for directing steam from said plenum outwardly from said tool, and a pile scraping blade member extending



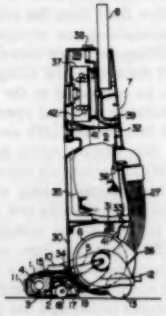
along said tool and projecting transversely beyond said surface.

4,446,594

UPRIGHT TYPE ELECTRIC CLEANER

Syuji Watanabe, Ibaraki; Yoshitaro Ishii, and Masao Sunagawa, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 1, 1982, Ser. No. 383,946
Claims priority, application Japan, Jun. 3, 1981, 56-84434
Int. Cl.³ A47L 9/00
U.S. Cl. 15—323 5 Claims



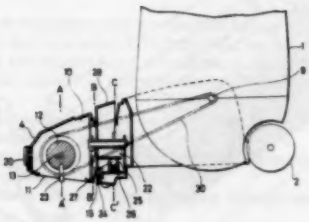
1. An upright type electric cleaner comprising: a main body case including an upper portion, a middle portion, and a lower portion, a cord reel chamber means disposed in said upper portion of said main body case for receiving a cord winding means, a bag compartment means disposed in said middle portion of said main body case for receiving a dust filter means, a blower chamber means disposed at the lower portion of said main body case for receiving a blower means and a driving means, a suction port body for supporting said main body case thereon for a tilting movement, a sound absorbing duct means disposed in said compartment means in communication with said cord reel chamber means and said blower chamber means for reducing a noise level of the cleaner, and wherein at least a portion of air introduced from said suction port body through said bag compartment means is exhausted from said blower chamber means through said sound absorbing duct means into said cord reel chamber means whereby the air cools the cord reel chamber means.

4,446,595

UPRIGHT VACUUM CLEANER

Seiichi Nakada, Yokaichi; Hiroshi Ohno, Otu; Tsuneo Nishijima, and Hiroshi Kawakami, both of Yokaichi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP81/00069, 371 Date Dec. 2, 1981, 102(e) Date Dec. 2, 1981, PCT Pub. No. WO81/02830, PCT Pub. Date Oct. 15, 1981
PCT Filed Apr. 30, 1981, Ser. No. 328,575
Claims priority, application Japan, Apr. 2, 1980, 55-43945
Int. Cl.³ A47L 5/34
U.S. Cl. 15—365 2 Claims



1. An upright vacuum cleaner comprising a main body having a fan motor and a dust collector; a floor nozzle housing a rotary brush disposed at a suction port therein; a drive pulley coupled to said rotary brush, an idle pulley separated from and disposed generally parallel and adjacent said drive pulley; a substantially flat belt for transmitting rotation from said fan motor to one of said pulleys; a belt switching mechanism for shifting said flat belt for selective engagement with the drive pulley or the idle pulley; a brush disposed rearwardly of said suction port; and a brush moving mechanism for moving the brush into and out of the bottom of said floor nozzle;

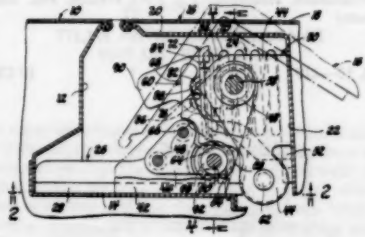
wherein said belt switching and brush moving mechanisms are operatively connected such that when said flat belt engages the drive pulley, said brush is retracted into said bottom of the floor nozzle, and when said flat belt engages said idle pulley, said brush projects out of said bottom of the floor nozzle to contact a floor.

4,446,596

DOOR HINGE AND HOLD OPEN

Alfonsas Arlauskas, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 19, 1982, Ser. No. 369,587
Int. Cl.³ E05D 11/10
U.S. Cl. 16—333 3 Claims



1. A door hinge and hold open comprising, in combination, a first hinge member having a base and laterally spaced first and second legs, a second hinge member having a base and laterally spaced first and second legs, each juxtaposed to a respective first and second leg of the first hinge member and

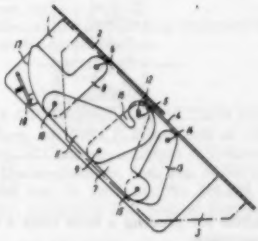
pivotally secured thereto for movement of the second hinge member relative to the first hinge member between open and closed positions, a hold open lever located immediately adjacent to the first leg of the second hinge member and including an edge portion provided with at least one detent shoulder, means pivotally securing the lever to the first leg of the second hinge member, a follower on the first leg of the first hinge member engageable with the edge portion of the lever and a detent shoulder of the lever during relative movement of the hinge members to releasably locate the second hinge member in open position, an annular spring mount extending between the second leg of the second hinge member and the hold open lever, peripherally spaced rib means on the spring mount, shoulder means on the second leg of the second hinge member and on the hold open lever releasably respectively engaged by the rib means, and spring means extending between the base of the second hinge member and the spring mount exerting a bias on the spring mount to seat the rib means and shoulder means and bias the edge portion of the lever and the detent shoulder into engagement with the follower.

4,446,597

HINGE DEVICE FOR INCLINED TILTING TYPE WINDOWS WITH EXTERNAL COVER RAILS

Bendt Dantzer-Sorensen, Holte, Denmark, and Per B. Christensen, The Canary Islands, Spain, assignors to V. Kann Rasmussen Holding A/S, Soborg, Denmark

Filed Jun. 22, 1982, Ser. No. 390,972
Claims priority, application Denmark, Jul. 3, 1981, 2969/81
Int. Cl.³ E05D *15/32*
U.S. Cl. 16—364 **1 Claim**



1. A hinge device for inclined tilting type windows having a stationary main frame and a tiltable sash with external cover rails on said main frame and said sash in overlapping relationship when the window is closed, comprising

a first hinge part including a first base plate to be mounted on said main frame,

a second hinge part including a second base plate to be mounted on said sash,

an intermediate member connected to said first base plate by means of substantially parallel links, said links being connected through lower pivot pins to said intermediate member and through upper pivot pins to said first base plate, so as to be displaceable in a substantially translatory parallelogram-like movement relative to said first base plate,

an upper pivot pin interconnecting said second base plate with said intermediate member and movable, by displacement of said intermediate member, between first and second positions in which it is located between the inner and outer surfaces of said main frame and spaced outwardly from its outer surface, respectively, and

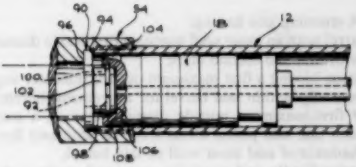
a coupling link having its ends pivotally connected by an upper pivot pin with said second base plate and by a lower pivot pin with an adjacent one of said parallel links, respectively, when the window is closed the upper pivot pins of the coupling link, the parallel links and the intermediate member are approximately in alignment and the lower pivot pins of the coupling link, the parallel links and the intermediate member are approximately in alignment, and are further so located that a line connecting the upper and lower pivot pins of the coupling link, when the window is closed, converges relative to a line connecting the upper and lower pivot pins of said adjacent pivotable link on said first base plate and said intermediate member, respectively, the upper pivot pin connecting said second base plate with said intermediate member being, in the same position of the hinge device, at least approximately coaxial with the upper pivot pin between said adjacent pivotable link and said first base plate.

4,446,598

STUNNING GUN

Ralph Karuhian, Los Angeles, Calif.; Robert G. Breukelman, and Lynn R. Weston, both of Huron, S. Dak., assignors to Kentmaster Mfg. Co., Inc., Los Angeles, Calif.

Filed Jul. 28, 1983, Ser. No. 517,003
Int. Cl.³ A22B *3/02*
U.S. Cl. 17—1 B **1 Claim**



1. A stunning gun having:

a barrel with an inner wall having a first inside diameter and with first and second ends;

a piston having a first maximum outside diameter supported coaxially within said barrel for movement therein;

said first maximum outside diameter having a magnitude such that said piston forms a slip fit with said first inside diameter of said inner wall of said barrel;

a probe fixedly and coaxially supported at the end of said piston corresponding to said second end of said barrel and moveable with said piston;

said piston and said probe each having intercommunicating air passages therethrough;

said air passage in said probe having a coaxial portion and a communicating exhaust portion at right angles thereto;

said piston having annular recesses in the outer surface thereof and carrying on its end corresponding to said first end of said barrel a region of magnetic material;

a handle portion carried by said barrel at said first end thereof and having an air inlet aperture and intermediate and outlet chambers therein,

said intermediate chamber and said outlet chamber being intercoupled for air passage therethrough; said outlet chamber being coupled, for air passage, to said barrel;

a valve assembly carried in said handle and interposed between said air inlet aperture and said intermediate chamber for control of air flow between said inlet aperture and said intermediate chamber and, consequently, for control of air into said barrel;

piston-retaining means carried within said handle adjacent said first end of said barrel for releasably retaining said piston in a position adjacent said first end of said barrel prior to the firing of said gun, said retaining means comprises a spring member carried in said handle portion, said piston having a recess in its end corresponding to said first end of said barrel, said recess having an inner groove therein, said inner groove being adapted to receive said spring member carried in said handle for retaining said piston in a retracted position;

said inlet aperture being adapted for coupling to a source of compressed air; and,

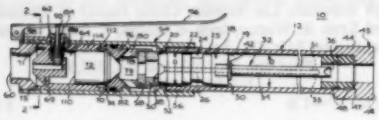
a trigger carried by said handle and positioned to engage and actuate said valve assembly for permitting the passage of compressed air from said inlet aperture to said piston to cause motion of said piston and the probe carried thereby.

4,446,599

STUNNING GUN WITH IMPROVED CONTROL VALVE

Ralph K. Karubian, and Gregorio J. Coelho, both of Los Angeles, Calif., assignors to Kentmaster Mfg. Co., Inc., Los Angeles, Calif.

Filed Sep. 16, 1983, Ser. No. 532,691
Int. Cl.³ A22B 3/02
U.S. Cl. 17—1 B **10 Claims**



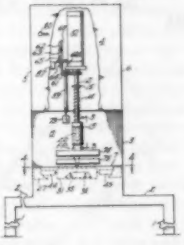
1. A stunning gun having:
a barrel with an inner wall having a first inside diameter and with first and second ends;
a piston having a first maximum outside diameter supported coaxially within said barrel for movement therein;
said first maximum outside diameter having a magnitude such that said piston forms a slip fit with said first inside diameter of said inner wall of said barrel;
a probe fixedly and coaxially supported at the end of said piston corresponding to said second end of said barrel and moveable with said piston;
said piston and said probe each having intercommunicating air passages therethrough;
said air passage in said probe having a coaxial portion and a communicating exhaust portion at right angles thereto;
said piston having annular recesses in the outer surface thereof and carrying on its end corresponding to said first end of said barrel a region of magnetic material;
a handle portion carried by said barrel at said first end thereof and having an air inlet aperture;
an insert carried coaxially within said handle portion and having an inlet port communicating with said air inlet aperture of said handle portion and having an intermediate chamber with a cylindrical inner wall having a first diameter;
control valve means carried in said insert for selectively coupling said air inlet port to said intermediate chamber;
a main valve spool having a cylindrical body portion with an axis which is coaxial with said intermediate chamber and having an outer diameter such that it forms a slip fit with said cylindrical inner wall of said cylindrical inner wall of said insert, said main spool having a flat end facing said control valve means, the opposite end of said main spool having a tapered portion;
an annular-groove portion coupling said tapered portion of said main spool to said cylindrical body portion thereof;
said annular-groove portion having a pressure surface the generating element for which is other than parallel with the axis of said cylindrical body of said main spool;
a porting element caused coaxially in said handle adjacent said insert portion at the end thereof carrying said main valve spool and having an entrance-opening tapered to cooperate with said tapered portion of said main valve spool, said porting element having an output chamber therein communicating with said entrance opening and with said barrel for passing air to said barrel, under the control of said control valve, to activate mid piston;
said control valve including means responsive to the application of compressed air to said air inlet aperture to open said control valve, whereby air may flow from said air inlet aperture, through said intermediate chamber to said flat end of said main valve spool to urge said main valve spool towards said porting element and said tapered portion of said main valve spool into engagement with said tapered entrance-opening of said porting element with a force greater than that produced in the opposite direction by compressed air operating upon said pressure surface of said annular-groove portion of said main valve spool;
said control valve further including means responsive to selective activation of said control valve in the presence of compressed air applied to said air inlet aperture to close said control valve, whereby air flow through said intermediate chamber to said flat end of said main valve spool is cut off and said tapered end of said main valve spool is urged out of engagement with said tapered entrance opening of said porting element and the flow of air from said air inlet aperture to said piston is unimpeded; and,
means for selectively activating said control valve.

4,446,600

MACHINE FOR STRIPPING MEAT FROM FOWL LEG AND THIGH BONES

Eldon R. Hooley, P.O. Box 421, Creswell, Oreg. 97426, and David L. Dodge, 77799 Sunset Dr., Cottage Grove, Oreg. 97424

Filed May 17, 1982, Ser. No. 378,497
Int. Cl.³ A22C 21/00
U.S. Cl. 17—11 **6 Claims**



1. A machine for pressing a bone from a fowl part, said machine comprising,
a prime mover including a movable rod member for rectilinear travel, said rod member engageable at one end with the end of a bone in the fowl part,
a holder yieldably carried by said rod member for endwise engagement with a fowl part, said holder adapted for displacement relative the rod member during travel of said rod member to permit extension of said rod member end past said holder after the latter has come into abutment with a machine component, and
a stripping mechanism including cooperating blade members, means urging said blade members into and out of engagement with the bone of a fowl part, said stripping mechanism further including rail members on which said blade members are slidably mounted, means removably coupling said rail members on framework components of the machine to facilitate periodic removal and cleaning of the stripping mechanism, guide means confining the part bone against lateral movement during passage therepast with the bone in substantial alignment with said rod member, said guide means including spaced apart bone guides each having a collar portion of a size to permit laterally confined passage of a part bone, said guides mounted on said rail members in a detachable manner permitting the substitution of like guide means for the laterally confined passage of the bone of a different fowl part, shear means actuable to sever fowl part tendons subsequent to bone displacement beyond said blade members by said rod member.

4,446,601

SQUID CLEANING METHOD AND APPARATUS

Eben H. Carruthers, Warrenton, Oreg., assignor to Carruthers Equipment Co., Warrenton, Oreg.

Filed Aug. 23, 1982, Ser. No. 410,411
Int. Cl.³ A22C 25/14
U.S. Cl. 17—51 10 Claims

9. A method for the automatic cleaning of squid bodies which have been separated from their heads and tentacles comprising

creating an upstream, positive-advancement travel run for such a body, and transporting the body in a downstream direction along such run,

while so transporting the body, first, slitting the same along the length of one side to fillet the body, and thereafter, scrubbing the surface of the body which becomes exposed as a result of said slitting,

creating a downstream, positive-advancement travel run which is coextensive with the downstream end of the upstream run, and transferring the body from the upstream run to the downstream run to effect continued downstream transport of the body with the body surface therein which is opposite the first-mentioned body surface now exposed, and

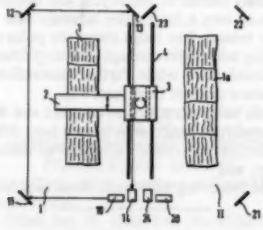
while so continuing the downstream transport of the body, scrubbing such opposite surface.

4,446,602

MACHINE OPERATOR PROTECTION SYSTEM

Hans-Jürgen Marx, and Fritz P. Hösel, both of Mönchengladbach, Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany

Filed Aug. 26, 1981, Ser. No. 296,486
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1980, 3032584
Int. Cl.³ D01G 31/00, 7/12
U.S. Cl. 19—0.21 10 Claims



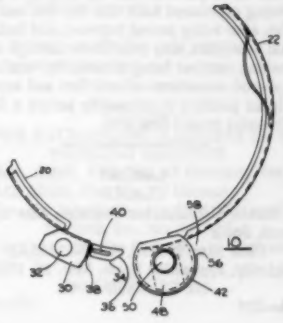
1. A system for monitoring and securing a selected one of a plurality of danger zones associated with a power driven machine for opening textile fiber bales, which machine includes a removal member mounted for displacement between two operating positions each associated with a respective danger zone, the removal member being driven, when it is in a selected operating position and the machine is in operation, to move in a manner to endanger an individual present in the respective zone associated with that position, said system comprising: radiation emitting means associated with each danger zone for producing at least one beam of directed radiation which is directed along a substantially closed path which completely encloses its associated danger zone; radiation responsive means positioned in the path of the radiation beam associated with each danger zone for producing an output indication when the at least one beam is interrupted at any point along the substantially closed path; control means connected to said radiation responsive means for halting movement of the removal member in response to appearance of such output indication; and signal generator means responsive to displacement of the removal member between its operating positions for actuating only that one of said radiation emitting means and its associated radiation responsive means whose beam path encloses that zone associated with the existing operating position of the removal member.

4,446,603

METER CLAMPING RING

Richard S. Guller, Newton, N.J., assignor to E. J. Brooks Company, Newark, N.J.

Filed Mar. 9, 1982, Ser. No. 356,335
Int. Cl.³ B65D 63/00
U.S. Cl. 24—21 9 Claims



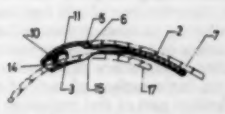
1. A clamping ring for an electric meter housing or the like, said ring having adjacent end portions having lock bolt receiving apertures, said ends being movable together to align said apertures to allow a lock bolt to be inserted therein, and cooperating means on said ends which are shaped, dimensioned and positioned to automatically releasably latch together when the apertures are moved together into alignment, to retain the ends in position to receive a lock bolt into said aligned apertures.

4,446,604

WRIST BRACELET CLASP

Lin Sen-Yi, No. 32, Alley 60, Lane 288, Yu Nung Rd., Tainan, Taiwan

Filed Apr. 1, 1982, Ser. No. 364,409
Int. Cl.³ A44B 21/00
U.S. Cl. 24—68 J 8 Claims



1. A clasp for a wrist bracelet, said wrist bracelet having first and second ends, said clasp comprising:

a first arm having an elongate base plate, upstanding flanges on either side of said base plate at a first end thereof, and an opening through said base plate intermediate said first end and a second end thereof, said opening being adapted to receive therethrough a first end of a wrist bracelet;

a second arm having a stepped portion and a base portion at

first and second ends thereof, a downwardly projecting hook portion mounted at said first end of said second arm and thus at the end of said stepped portion, and upstanding flanges on either sides of said base portion at the junction thereof with said stepped portion, said second arm flanges being adapted to mount a second end of a wrist bracelet;

pivot means for pivotally connecting said second ends of said arms so that said first and second arms are pivotable between an open position in which said first ends of said arms are spaced apart and a closed position in which said first ends of said arms are in close adjacency, said hook portion for releasably securing said first ends of said arms in said closed position; and

locking means on said first arm at a location remote from said pivot means, said opening being located intermediate said locking means and said pivot means, said locking means comprising a pivotable locking member spaced vertically from said base plate such that a first end of a wrist bracelet may be passed freely between said locking member and said base plate, and said locking means comprising a catch means for mating securing engagement with said hook portion, said opening through said base plate being positioned such that the first end of the wrist bracelet, after being passed between said locking member and said base plate, may pass freely through said opening, said locking member being actuated by said hook portion upon pivotal movement of said first and second arms to said closed position to releasably secure a first end of a wrist bracelet to said first arm.

4,446,605

CLAMP

Eugeni C. Molas, Urbanizacion Fournier, casa 1, La Garriga (Barcelona), Spain

Filed Mar. 8, 1982, Ser. No. 355,924
Claims priority, application Spain, Mar. 25, 1981, 287461
Int. Cl.³ B65D 63/02
U.S. Cl. 24—277 **6 Claims**

1. A clamp, comprising

a ring having two ends defining a split in said ring, two projections extending outwardly from said ring, each of said projections being integrally formed with said ring adjacent a respective one of said two ends, each of said projections having an inner surface and an outer surface, the inner surface of each of said projections opposing the corresponding inner surface of the other of said projections and the outer surface of each of said projections being the farthest part of that projection from the corresponding outer surface of the other of said projections;

securing means provided on said outer surfaces of said two projections;

a member adapted to be received on said projections and engage with said securing means, inward movement of said member on said projections causing said projections to move towards each other, thereby causing said two ends of said ring to be brought towards each other, whereby a body passing through said ring is gripped thereby;

handles provided on said ring and extending outwardly therefrom to facilitate manual handling of said clamp;

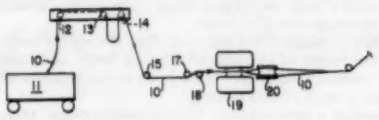
projecting parts formed in said ring adjacent said split and extending substantially radially from the inner surface of said ring, said projecting parts being forced against said body when said clamp is tightened; and a plurality of interengaging means formed on the inner surfaces of said two projections.

4,446,606

CONTINUOUS COMPRESSIVE PRESHRINKING AND DRYING METHOD

Jackson Lawrence, West Sand Lake; Harry A. Webb, Menands, and John R. Frederick, Cohoes, all of N.Y., assignors to Cluett, Peabody & Co., Inc., New York, N.Y.

Filed Oct. 15, 1980, Ser. No. 197,297
Int. Cl.³ D06C 21/00
U.S. Cl. 26—18.6 **4 Claims**



1. A method of continuous preshrinking and drying of cellulosic fabric with reduced one-sidedness comprising

(a) mechanically preshrinking cellulosic fabric having an initial moisture content of about 15% to 25%,

(b) conveying said fabric after preshrinking about a heated drier drum while restraining said fabric dimensionally widthwise and lengthwise,

(c) while thus conveying and restraining said fabric, controllably reducing the moisture content of said fabric to a residual amount of about 5% to 14%,

(d) the upper limit of said residual amount providing sufficient dimensional integrity to enable the fabric to be further handled without significant loss of preshrinkage previously imparted,

(e) the lower limit of said residual amount being such as to assure, upon removal of the fabric from said drum, sufficient moisture to enable additional shrinkage of the fabric to occur and to provide greater uniformity in the fabric by accommodating migration of residual moisture within the fabric from one side toward the other,

(f) immediately thereafter conveying said fabric in a tensionless manner into a loop drier wherein said fabric is arranged in tension-free loops about the poles of said drier,

(g) conveying said fabric through said loop drier in an essentially relaxed state while further controllably reducing said moisture content to at least 4%,

(h) said fabric being permitted to contract and thereby being further preshrunk lengthwise in said loop drier by reason of said further controlled reduction of moisture by said loop drier, and

(i) thereafter removing said fabric from said loop drier.

4,446,607

APPARATUS AND METHOD FOR FORMING AN EXTERNAL GUARD MEMBER ON A HOSE

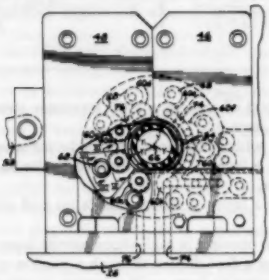
Paul H. Merritt, East Peoria, and Francis W. Fuller, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US81/01025, 371 Date Jul. 30, 1981, 102(e) Date Jul. 30, 1981, PCT Pub. No. WO83/00455, PCT Pub. Date Feb. 17, 1983
PCT Filed Jul. 30, 1981, Ser. No. 294,758
Int. Cl.³ B23P 23/04
U.S. Cl. 29—33 E **13 Claims**

1. In an apparatus for forming a guard member on a hose, said apparatus having a frame, first means for supporting at least one of said guard member and said hose along a longitudi-

nal axis, and second means for feeding a continuous strand of guard material from a supply source to said apparatus, the improvement comprising:

a forming head mounted on said frame for forming a coil-shaped guard member circumferentially about and radially spaced from said hose, said head having separable first and second portions and a plurality of die members rotatably mounted on respective ones of said first and said second portions in arcuate positions which are spaced relative to each other, at least two of said plurality of die members being mounted on said first portion of the forming head at an equally radially spaced predetermined first distance from said longitudinal axis, and at least one of

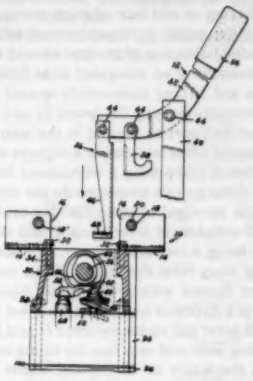


said plurality of die members being mounted on said second portion of the forming head at a radially spaced second distance greater than said predetermined first distance from said longitudinal axis when said second portion is in an abutting relationship with respect to said first portion;

means for selectively separating said first and said second portions; and

wherein said second means for feeding a continuous strand of guard material includes a plurality of driven rollers for propelling said continuous strand of guard material into pressure contact with said plurality of die members and rotating said formed coil-shaped guard member about said hose.

leaving the center of the cap exposed when the lever is pivoted about the attachment link pivot, said depresser



member having an effective axis substantially parallel to that of the attachment link.

4,446,608

VALVE SPRING COMPRESSOR FOR INTERNAL COMBUSTION ENGINE

Joel S. Johnson, Troy, Mich., assignor to Kent-Moore Corporation, Warren, Mich.

Filed Jul. 26, 1982, Ser. No. 401,873

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—220 **6 Claims**

1. A tool for compressing valve springs of a valve-in-head internal combustion engine comprising, in combination:

a lever;

a fulcrum to be temporarily attached to the engine;

an attachment link having two ends, pivotably attached to the lever at the first end and removably attachable to the fulcrum at the second end;

a depresser member having two ends, pivotably attached at one end to the lever at a point spaced from the attachment link pivot and having means at the second end for cooperation with the valve spring cap to depress same while

---

4,446,609

A TOOL FOR EXCHANGING A MATRIX IN A METAL WORKING MACHINE

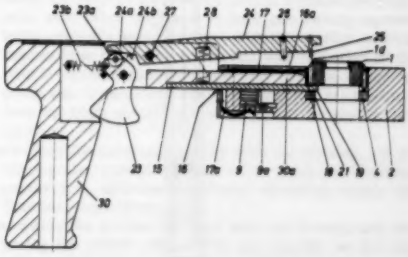
Walter Bredow, Alfeld, Fed. Rep. of Germany, assignor to C. Behrens AG, Alfeld, Fed. Rep. of Germany

Division of Ser. No. 226,154, Jan. 19, 1981. This application Sep. 20, 1982, Ser. No. 421,117

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1980, 3005089

Int. Cl.³ B25B *27/00*

U.S. Cl. 29—270 **2 Claims**



1. A tool for withdrawing a matrix having an axis and a peripheral surface from a matrix shoe adapted to be mounted on a tool holder of a metal working machine and provided with a matrix seating ring and a pair of clamping levers which are pivotally movable between a clamping position in which the clamping levers clamp the matrix in the matrix shoe and a clearing position in which the clamping levers release the former from the latter and permit withdrawal of the matrix from the shoe, the shoe having an elongated cutout with an open end and an opposite abutment face, and the matrix having a catch bore and the matrix seating ring having a withdrawal recess and being located in the cutout with part of its peripheral surface pressed against the abutment face in said clamping position, the tool comprising tool means for pivotally moving said levers to said releasing position and for withdrawing said matrix from said matrix shoe, said tool means including first means movable between the levers for moving the same from the clamping to the clearing position, second means for engag-

ing the matrix for withdrawing the latter between the levers from the shoe, and a pistol-shaped handle portion and an elongated portion projecting form an upper part of said handle portion and having an end face adapted to engage the peripheral surface of the matrix during movement of the tool means in the longitudinal direction of the shoe toward the matrix, said first means comprising an elongated slide fixed to said elongated portion and having transversely spaced side edges engaging and pivotally moving the levers to said releasing position and a free end portion located in the matrix seating ring withdrawal recess when said end face engages said matrix, and said second means comprising a withdrawal lever above said slide tiltable about an axis transverse to the elongation of the latter and a pin arranged to enter into the catch bore during tilting of said withdrawal lever toward said slide, said withdrawal lever being a two-armed lever, provided on one arm thereof facing away from the matrix with a cam face and on the other arm thereof with spring means biasing said withdrawal lever in a direction which said pin is out of engagement with the catch bore, and means mounted in said handle portion and cooperating with said cam face for tilting said withdrawal lever against the action of said spring means in a direction toward said slide so that said pin will enter into the catch bore.

4,446,610

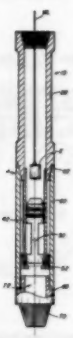
RETRIEVABLE FLOAT VALVE ASSEMBLY

Larry V. Cooper, Lake Charles, and Michael W. Sloane, Sr., Egan, both of La., assignors to Ace Fishing & Rental Tools, Inc., Lake Charles, La.

Division of Ser. No. 201,580, Oct. 28, 1980, Pat. No. 4,393,940. This application May 4, 1983, Ser. No. 491,353

Int. Cl.³ B23P *17/00*; E21B *33/00*

U.S. Cl. 29—421 E **6 Claims**



1. A method of disassembling a portion of a drill string containing a float valve comprising the steps of:

a. locating a float valve within a lowermost jointed portion of the drill string and a distance below the jointed connection formed in the drill string by the lowermost jointed portion and a connected uppermost jointed portion;

b. forming a suspended connection between the uppermost portion of the drill string and the float valve which is located below the jointed connection adjacent to the lowermost jointed portion;

c. lowering an explosive charge to the jointed connection above the float valve;

d. detonating the explosive charge at the jointed connection above the float valve to loosen the jointed connection;

e. disassembling the uppermost jointed portion and connected float valve from the lowermost jointed portion.

4,446,611

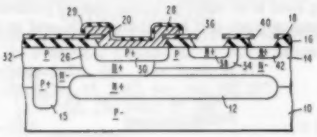
METHOD OF MAKING A SATURATION-LIMITED BIPOLAR TRANSISTOR DEVICE

David L. Bergeron, Winooski, Vt., and Parsotam T. Patel, Round Rock, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 163,035, Jun. 26, 1980, Pat. No. 4,390,890. This application Feb. 22, 1983, Ser. No. 468,442

Int. Cl.³ H01L *21/225*

U.S. Cl. 29—578 **12 Claims**



4. A method of making a PNP transistor structure which includes the steps of;

forming a subcollector in a semiconductor substrate,

depositing a layer of silicon dioxide on the surface of said substrate,

depositing a layer of silicon nitride on said silicon dioxide layer,

defining an opening in said silicon nitride layer,

introducing a first dopant through a portion of the area of said opening to form an N+ region in said substrate extending from said subcollector to the surface of said substrate,

introducing a second dopant through the entire area of said opening to form a P+ region at the surface of said substrate, said P+ region having one end extending outside of said N+ region, and

forming a P region having a first section on one side of said N+ region and a second section on the opposite side of said N+ region and in contact with said P+ region, the dopant concentration of said P region being less than that of said first dopant and the dopant concentration of said P+ region being greater than that of said first dopant.

4,446,612

METHOD AND APPARATUS FOR CONTROLLING TOOL MAGAZINES

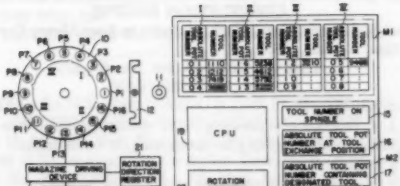
Toshio Kawakami, Zama, and Izumi Kimura, Numazu, both of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1981, Ser. No. 335,715

Claims priority, application Japan, Jan. 9, 1981, 56-1920

Int. Cl.³ B23Q *3/157*; G05B *19/27*

U.S. Cl. 29—568 **8 Claims**



6. Apparatus for controlling a tool magazine having a plurality of tool pots each containing a tool, said tool magazine being divided into at least three tool regions respectively containing

substantially the same number of tool pots, said apparatus comprising:

reversible magazine driving means for sequentially indexing a designated tool to a tool exchange position;

a first memory section including a comparison table storing correspondences between absolute pot number of respective regions and tool numbers included in respective regions;

a second memory section including a first memory region for storing a tool number of a tool mounted on a machine tool, a second memory region for storing an absolute pot number of a tool pot indexed to said tool exchange position, a third memory region for storing the absolute pot number of a tool pot containing said designated tool and a fourth memory region for storing the designated tool number;

means for searching said absolute tool pot number storing said designated tool in accordance with said comparison table prior to movement of said tool magazine;

means for determining a direction of movement of respective regions of said tool magazine towards said tool exchange position in accordance with contents of said second memory section;

means controlled by the contents of said first and second memory sections for determining an amount of movement of said tool magazine necessary to index said designated tool to said tool exchange position; and

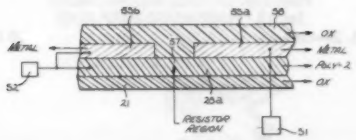
magazine drive means controlled by said direction determining means and said movement amount determining means for indexing said designated tool to said tool exchange position.

4,446,613

INTEGRATED CIRCUIT RESISTOR AND METHOD OF FABRICATION

Israel Beinglass, Santa Clara, and Nan-Hsiung Tsai, Fremont, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Oct. 19, 1981, Ser. No. 312,771
Int. Cl.³ H01L *29/00*; H01C *17/00*
U.S. Cl. 29—571 **5 Claims**



1. A process for fabricating an integrated circuit resistor on a first insulative layer, comprising the steps of:

forming a strip of polysilicon on said first insulative layer using an overlying silicon nitride member;

removing a portion of said silicon nitride member from said strip overlying a predetermined region of said strip;

growing an oxide layer on said strip at regions unprotected by said silicon nitride member, such that oxide is formed at least on the sides of said strip;

removing said silicon nitride member; and

forming metal members over opposite ends of said strip of polysilicon without forming metal over said predetermined region of said strip,

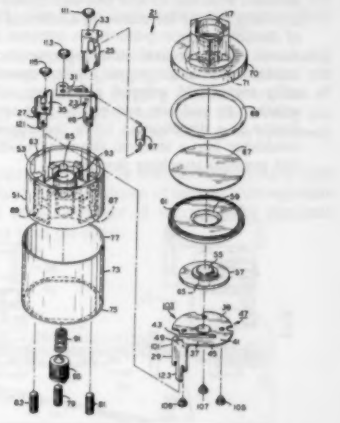
whereby said predetermined region of said strip of polysilicon forms a resistor region and said metal members form low resistance leads for said resistor region.

4,446,614

METHOD OF MANUFACTURING A CONTROL DEVICE

Donald L. Haag, Sterling, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Feb. 16, 1982, Ser. No. 349,329
Int. Cl.³ H01H *11/00*
U.S. Cl. 29—622 **5 Claims**



2. A method of manufacturing a control device having a housing with a chamber therein, a plurality of terminals each having a contact section thereon, and a switch and terminal combination including another terminal, a pair of bifurcated switch segments having a bight portion therebetween, and a pair of generally opposite sides on at least one of the switch segments extending generally from the bight portion, the method comprising the steps of:

forming the switch segments and another terminal integrally with each other with said at least one switch segment being pivotally interconnected with the another terminal remote from the bight portion and with the other of the switch segments extending generally adjacent either opposite side of the at least one switch segment in a direction from the bight portion generally toward the another terminal;

associating the terminal plurality with the housing and arranging the contact sections of the terminal plurality generally at different preselected elevations within the chamber, respectively; and

associating the another terminal with the housing and disposing the switch segments in the chamber so that the other switch segment extends in overlaying spaced apart relation with the contact sections of the terminal plurality, respectively.

4,446,615

APPARATUS FOR ATTACHING TERMINALS TO THE ENDS OF ELECTRIC CONDUCTORS

Lloyd A. Talley, Valinda, Calif., assignor to Eubanks Engineering Company, Monrovia, Calif.

Filed Mar. 16, 1982, Ser. No. 358,833
Int. Cl.³ H01R *43/04*
U.S. Cl. 29—742 **5 Claims**

1. Apparatus for attaching terminals to the ends of electric conductors, comprising:

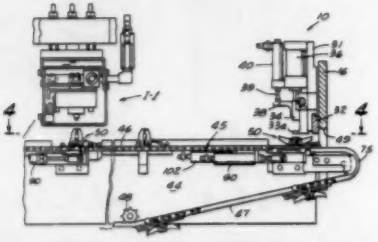
a. means for delivering predetermined lengths of electric conductors into a conductor supply zone;

b. a terminal attaching zone spaced from said conductor supply zone, including spaced apart first and second terminal attaching devices each having cooperable terminal attaching die means for receiving a terminal therebetween

having an end portion for the reception of an end of said conductor and being operable to crimp the end portion on the received conductor end;

c. means for picking up and successively transporting the conductor lengths laterally along a conveyor path from the conductor supply zone to said first terminal attaching device for attaching a terminal to one end of the conductor and thereafter transporting the conductor with the terminal attached to said one end to the second terminal attaching device for attaching a terminal to the other end of the conductor.

d. means in the terminal attaching zone including a pair of rotatable conductor gripping rollers operable to longitudinally move said gripped conductor with the terminal attached to said one end by the first terminal attaching device in a direction to bring the opposite end of said conductor into a terminal attaching position by said second terminal attaching device;



e. an electrical motor having a driving connection with one of said rollers;

f. switching means activated by the lateral movement of said conductor to energize said motor, and by longitudinal movement of the conductor to a predetermined sensed position to de-energize said motor and apply a braking force to stop the movement of said conductor by said rollers, said switching means comprising a pair of switches having actuating components laterally spaced relatively to the longitudinal axis of said conductor and being positioned for activation by the conductor during said lateral movement thereof; and

g. swingably mounted raker elements operable, upon the approach of the conductor to said switch actuating components, to engage the conductor at positions respectively adjacent said switch actuating components and thereby forcibly augment its movement into operative association with the switch actuating components.

4,446,616

POWER ASSIST, MANUAL, BAND LABELER

Theodore Waterman, Christmas Tree La., Milford, N.H. 03055

Filed Dec. 17, 1981, Ser. No. 331,607
Int. Cl.³ B23P *21/00*; B65B *7/28, 67/00, 9/10*
U.S. Cl. 29—775 **10 Claims**

1. A power assist, manual, band labeler enabling an operator to apply plastic labels to containers comprising:

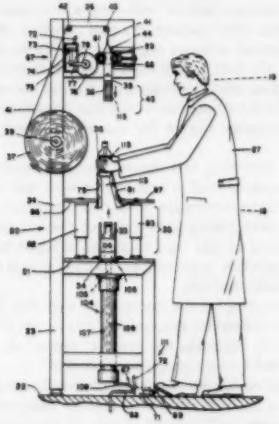
powered conveyor means for advancing a plurality of identical containers along a horizontal path, including a banding station at about waist level;

powered band supply means for feeding a plurality of bands of flexible, resilient plastic, in flat tubular, preperforated, form individually and successively around band spreader means mounted above said station to a tear off location at about eye level;

said band spreader means being located within the flat tubular form of said bands and having opposite side walls, oppositely disposed concave recesses in each said side wall and a feed roll, seated in each said recess, for feeding said bands;

a fixed holder and an oppositely disposed, pivotable, holder normally inclined toward said fixed holder, said holders mounted at said station, intermediate of waist and eye levels, and adapted to support a band in open tubular form, placed thereover by said operator;

said pivotable holder being spring biased to resiliently pivot outwardly for the passage of a container between said holders;



power actuated container lift means at said station for lifting each successive container, halted at said station, upwardly between and through said holders to frictionally transfer a band therefrom onto the exterior of said container;

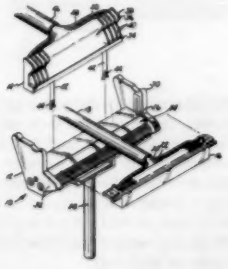
and control means for retracting said container lift means to waist level to receive the next successive container while actuating said band supply means to feed the next successive band along said spreader into tear off position.

4,446,617

SPLICING HEAD FOR ADDING CONDUCTORS TO AN ELECTRICAL CONNECTOR

Donald J. Lydell, deceased, late of Park Rapids, Minn., and by Hilda Lydell, executor, Rte. 4, Box 414, Park Rapids, Minn. 56470

Filed Feb. 16, 1982, Ser. No. 348,321
Int. Cl.³ H01R *43/04*; B23P *00/00*
U.S. Cl. 29—861 **10 Claims**



1. A method of connecting a second cable containing a plurality of pairs of wires to a modular connector which has a connected first cable, the method comprising the following steps:

laying the modular connector with the connected first cable on a bed;

mounting a comb having a plurality of wire guides, each guide including a wire pair splitter onto the bed, over the first cable in position to permit access to the connector, the wire guides extending in the direction of extension of the first cable;

aligning the second cable generally parallel to and above the first cable;

separating the wire pairs in the second cable;

laying each wire pair of the second cable in its separate wire guide on the comb;

separating the wires of each pair with the pair splitter for the respective guide; and

connecting the wires of the second cable to the modular connector without disconnecting the wires of the first cable and without removing the comb from the bed.

2. In a portable splicing head for attaching pairs of wires from a cable to an electrical connector, the head having a body with a bed for holding the connector and a comb including a plurality of wire guides for separating pairs of wires, each wire guide having a pair splitter for separating the wires of the pair, the improvement of a mounting device for the comb to aid in adding a second cable to contacts of a connector to which is connected a first cable, the mounting device comprising:

means coupled to the comb and body for removably mounting the comb on the body in position spaced from the bed and offset from the position on the bed where a connector is to be held sufficient to permit access to a connector on the bed for providing a passageway between the comb and the body for a first cable connected to a connector on the bed, the mounting means comprising a plurality of elongated supports extending between one side of the comb and the body.

4,446,618

PROCESS FOR THE PRODUCTION OF BI-METALLIC CONTACT RIVETS

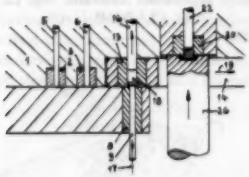
Erwin Bollian, Rastatt, Fed. Rep. of Germany, assignor to Dr. Eugen Durrwachter Doduco KG, Pforzheim, Fed. Rep. of Germany

Filed Mar. 26, 1982, Ser. No. 362,085

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1981, 3112483

Int. Cl.³ H01R *43/04*; B21K *1/62*; B23K *20/02*

U.S. Cl. 29—882 5 Claims



1. A process for producing a bi-metallic contact rivet by means of a cold pressure welding operation, comprising:

inserting two wire segments of different composition and length but of congruous diameter into a first guide bush which fits the two wire segments, the diameter of the wire segments being smaller than that of the contact rivet shaft to be produced;

arranging of the two wire segments, which frontally impinge on one another, between an ejector pin displaceable lengthwise in the first guide bush, and a movable abutment having a cross-sectional surface larger than the cross-sectional surfaces of the wire segments, and arranged coaxially to the ejector pin adjacent to the first guide bush and initially abutting the adjacent end surface of the first guide bush;

pushing forward the ejector pin in the first guide bush and simultaneously withdrawing the abutment from the first guide bush coaxially with the forward movement of the ejector pin while leading the wire segments into a second guide bush in which the abutment is moveable, the relationship between the cross-sectional surfaces of the first guide bush and second guide bush being proportional to the relationship between the velocities of the ejector pin and the abutment;

maintaining the velocity of the abutment relative to the first guide bush smaller than the velocity of the ejector pin relative to the first guide bush, while maintaining both velocities in constant relationship to one another;

upsetting the wire segments in accordance with a decreasing distance between approaching surfaces of the ejector pin and of the abutment, and forming a blank therefrom of enlarged and uniform cylindrical shape and having the diameter of the shaft of the contact rivet to be produced; and

forming a contact rivet head by cold press-working at that end of the blank constituting one of the two wire segments forming the blank, said one of the two wire segments being shorter than the other.

4,446,619

RAZOR HANDLE

Chester F. Jacobson, Southboro, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Jun. 7, 1982, Ser. No. 385,905

Int. Cl.³ B26B *21/14*

U.S. Cl. 30—85 2 Claims

1. A razor handle comprising a grip portion, a neck portion continuous with one end of said grip portion and extending at an angle to said grip portion, a fixed protrusion extending substantially axially from an end of said neck portion for connecting a shaving unit to said handle, and a pusher member molded integrally with said handle proximate said neck portion, said pusher member having first and second legs disposed at an angle to each other and joined by an integrally molded flexible hinge, said first leg extending from said grip portion and said second leg overlying said neck portion, said pusher member having a free end substantially coincident with a free end of said neck portion, said first leg having a pusher surface thereon, said pusher member being movable in response to pressure applied to said pusher surface by an operator to cause said free end of said pusher member to move in a direction substantially parallel with an axis of said neck portion to engage a shaving unit disposed on said protrusion to force said shaving unit axially of said protrusion and off said protrusion.

4,446,620

TUBE CUTTER, ESPECIALLY FOR PLASTIC TUBES

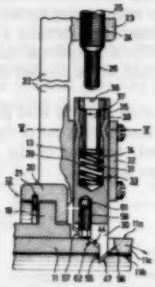
Karl-Heinz Velte, Weilrod, Fed. Rep. of Germany, assignor to Rothenberger GmbH & Co. Werkzeuge-Maschinen KG, Fed. Rep. of Germany

Filed Aug. 9, 1982, Ser. No. 406,619

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1981, 3136406

Int. Cl.³ B23D *21/10*; B29C *17/10*

U.S. Cl. 30—96 8 Claims



1. A tube cutter, comprising: a guide adapted to grip a tube to be cut and a cutting tool holder rotatable on the guide about the axis of a tube so gripped and adapted to hold a cutting tool with a separate beveling edge, the tool holder being resiliently urged towards the outer surface of the tube and having a stop to run only on an uncut portion of the outer surface adjacent the bevel cut therein by the separate bevelling edge of the cutting tool for limiting its movement theretowards.

4,446,621

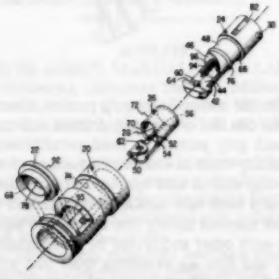
FABRIC REPAIRING TOOL WITH CYLINDRICAL SHEET METAL CUTTER

Wesley R. Peterson, Bound Brook, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Oct. 29, 1982, Ser. No. 437,716

Int. Cl.³ B26B *13/26*

U.S. Cl. 30—241 10 Claims



1. A fabric repairing tool including a stationary sleeve, an arbor slidable in said sleeve, a sheet metal cutter which is movable with the arbor and has a sharp helically extending edge thereon, and a sharp edged ring which is in alignment with the cutter and against which fabric is cut by sliding the arbor in a direction causing said helical cutting edge to enter the ring and in so doing to move around the sharp edge of the ring.

4,446,622

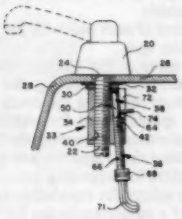
TOOL FOR REMOVING STUBBORN NUTS

William R. Lamphere, Mystic, Conn., assignor to John B. Dionne, Pawcatuck, R.I.

Filed Feb. 14, 1982, Ser. No. 466,092

Int. Cl.³ B26B *27/00*

U.S. Cl. 30—272 R 13 Claims



1. A tool for cutting and removing a nut from a threaded shank member extending beyond the nut comprising:

a body having a first threaded bore adapted to be threadedly received on the shank member in abutting relationship with the nut, said body having a second bore, at least partially threaded, with a longitudinal axis substantially parallel to the longitudinal axis of the first threaded bore; and

severing means including a fracturing element threadedly received within the second bore movable between a first position whereat said element is distant from the nut and fully retracted within said body and a second position whereat said element is engaged with the nut such that continued movement of said element into further engagement with the nut results in severing of the nut by said element.

4,446,623

NOTCHING TOOL

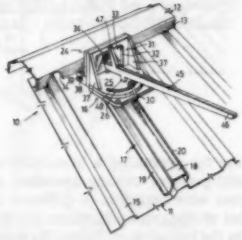
Edgar M. Stubbersfield, and Leslie V. Shaw, both of Gatton, Australia, assignors to Beryl Grace Stubbersfield, Australia

Filed Sep. 9, 1981, Ser. No. 300,486

Claims priority, application Australia, Sep. 12, 1980, PE5546

Int. Cl.³ B26B *13/06*

U.S. Cl. 30—229 6 Claims



1. A notching tool for notching sheet-like material comprising:

a base member, said base member having a pair of support flanges on the underside thereof;

a notching head on the base member comprising a die member and a punch member adapted to co-operate at a plane with the die member;

means to operate the notching head; and

wherein the base member includes a pair of spaced, substantially parallel support members, said support members secured to said support flanges and angularly inclined at

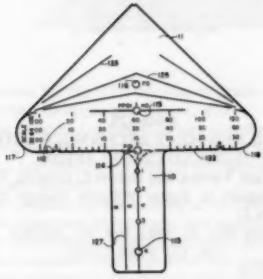
an obtuse angle relative to the plane of the punch and die members; and means to interconnect the support members, distance means between the support members being selected to accommodate a rib or protrusion on a first member with the punch and die members sized to form a notch in a sheet-like material wherein said notch co-operates with said rib or protrusion.

4,446,624

SINGLE HANDED SET-UP APPARATUS

Larry H. Nowell, Chula Vista, and Robert Halley, LaJolla, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 26, 1982, Ser. No. 411,777
Int. Cl.³ G01B *3/04*
U.S. Cl. 33—1 C **8 Claims**



1. A training device for training aircraft intercept operators in the use of a radarscope to coordinate the movement of a plurality of aircraft, comprising:

a template formed in the shape of a triangle having a base stem extending therefrom such that said stem bisects the hypotenuse of said triangle;

said triangle having imprinted thereon a plurality of range scales;

said stem having imprinted thereon longitudinal lines at predetermined separation; and

said template having a series of apertures along the centerline of said stem extending into said triangle.

4,446,625

APPARATUS FOR MOUNTING FLEXIBLE PRINTING PLATES

Edward F. Hagan, E. Brunswick, N.J., and Marvin G. Reaver, Jr., Mount Prospect, Ill., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

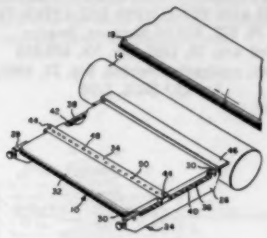
Filed Feb. 28, 1979, Ser. No. 15,934
Int. Cl.³ B41F *27/00*
U.S. Cl. 33—184.5 **8 Claims**

1. Apparatus for locating a flexible plate with respect to a printing cylinder, said apparatus comprising:

a frame including side bars;

a support structure between said side bars, said structure providing a flat platform for a plate and including a cross bar mounted for sliding movement between predetermined positions on said side bars, said cross bar having positionable keys adapted to project through registration apertures in a printing plate; and

locking means for fixing the location of said cross bar at one selected position with respect to said side bars such that said cross bar remains stationary with respect to said



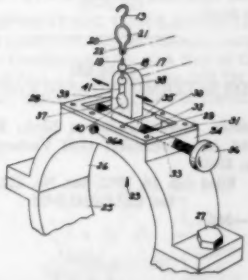
frame as the printing cylinder is rotated to apply a flexible plate thereto.

4,446,626

METHOD AND APPARATUS FOR ACCURATELY SETTING DIRECTIONAL HEADINGS IN MINING TUNNELS

Arnemann Grender, Franklin, Minn. 55333, and George F. Johnson, Jr., Rte. 4, Box 484-H, Pikeville, Ky. 41501

Filed Apr. 12, 1982, Ser. No. 367,587
Int. Cl.³ G01C *15/00*
U.S. Cl. 33—286 **14 Claims**



1. Apparatus for accurately setting directional headings in a mining tunnel of the type having side walls and a ceiling including a pair of spads attached to the ceiling along a reference line representing the desired heading, each of said spads having an eyelet-like opening, said openings being aligned along a line-of-sight establishing the desired heading, said apparatus comprising:

a light source comprising a laser transmitter emitting a relatively thin substantially monochromatic beam of visible light;

an elongated housing mounting said light source;

a pair of hanging means positioned at spaced locations on the upper surface of said light source housing for lockingly engaging a ball chain; and

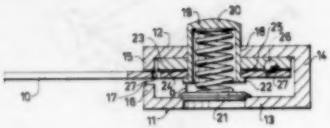
an elongated length of flexible ball chain composed of a plurality of spaced bulbous enlargements connected by thin rod-like members and having a portion lockingly cooperating with each of said hanging means and a portion held by a hook-like hanger for hangingly cooperating with each spad opening so that said housing is suspended from the spads such that said light beam is accurately aligned with said reference line to establish the desired directional heading.

4,446,627

ARRANGEMENT IN ANGLE RULERS FOR IMPROVING FIXTURE OF AN ANGULARLY ADJUSTABLE BLADE OF SAID RULERS TO THE STOCK THEREOF IN SELECTED BLADE POSITIONS RELATIVE THERETO

Bengt Persson, Pl. 577, 830 02 Mattmar, Sweden

Filed Aug. 20, 1982, Ser. No. 409,953
Claims priority, application Sweden, Sep. 21, 1981, 8105567
Int. Cl.³ B43L 7/06
U.S. Cl. 33—497 4 Claims



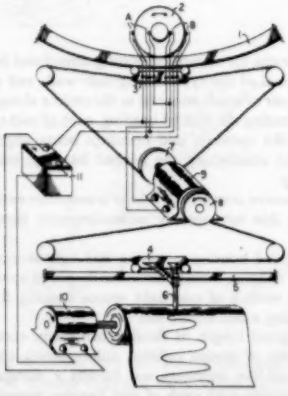
1. An angle ruler having a stock, an angularly adjustable blade and an arrangement for improved fixture of said angularly adjustable blade to said stock in selected angular positions, said arrangement comprising a rectangular hollow section being partially embraced by one end of said stock, wherein one of the two shorter sides of said hollow section is provided with a lateral opening defined by two opposed wall portions, a spring-loaded displaceable peg penetrating at least one of the mutually opposing walls of said hollow section and a bore of said blade, grooves provided on one of the inwardly facing surface of one of said walls and the opposite surface of said blade, and balls co-acting with said grooves on the other one of said surfaces, said grooves and balls being equally spaced and concentrically encircling said peg, around which said blade is arranged to pivot.

4,446,628

DEVICE FOR DETERMINING ANGLE OF INCLINATION OF SHIP

David Shkolnik, 62-42 Woodhaven Blvd., Rego Park, N.Y. 11374, and Alla Slonimsky, 1402 Ventura Way, Newport News, Va. 23602

Filed Sep. 16, 1982, Ser. No. 422,279
Int. Cl.³ G01C 9/06
U.S. Cl. 33—366 3 Claims



1. A device for determining an angle of inclination of a ship, comprising

a curved guiding member fixedly connected with a ship and inclinable together with the latter; member in response to inclination of the ship and thereby inclination of said curved guiding member between a plurality of positions;

means for recording an angle of inclination of the ship and operative in dependence upon a position of said rolling member on said curved guiding member, said recording means including a data carrier, a recorder arranged to record the angle of inclination on said data carrier, an electric motor arranged to displace said recorder and having an electric circuit, and a plurality of electric contacts in said electric circuit arranged so that during rolling of said rolling member and said contacts are closed by the latter and thereby said electric motor is energized and displaces saod recorder; and

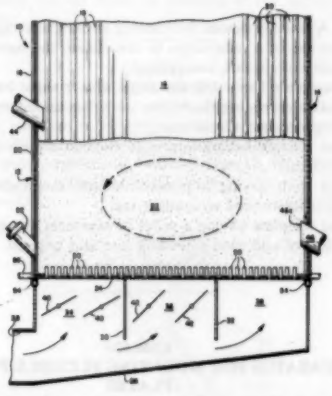
a carriage on which said electric contacts are arranged and which is displaceable together with said contacts by said electric motor relative to said curved guiding member substantially following the rolling of said rolling member on said curved guiding member.

4,446,629

FLUIDIZED BED HEAT EXCHANGER UTILIZING INDUCED CIRCULATION

Robert D. Stewart, Verona, and Robert L. Gamble, Wayne, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Nov. 17, 1981, Ser. No. 322,310
Int. Cl.³ F26B 17/10
U.S. Cl. 34—57 A 2 Claims



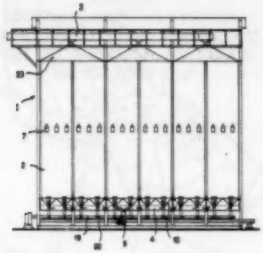
1. A fluidized bed heat exchanger comprising a plate adapted to support a bed of particulate material, inlet means for introducing additional particulate material to said bed, drain means communicating with said bed for discharging spent bed material, a plurality of perforations formed through said plate, an air plenum disposed adjacent said plate and adapted to introduce pressurized air through said perforations and into said bed, and a nozzle associated with each of said perforations for discharging said air into said bed, the number of perforations formed through said plate, and therefore the number of nozzles, increasing in a direction across said plate from said inlet means to said drain means so that the flow rate of air introduced into said bed varies in a direction from said inlet means to said drain means.

4,446,630

METHOD AND APPARATUS FOR SLOW COOLING OF HEATED GRAIN

Gérard Book, Senlis, France, assignor to SECEMIA, Senlis, France

Filed Oct. 9, 1981, Ser. No. 310,067
Claims priority, application France, Oct. 9, 1980, 80 21590
Int. Cl.³ F26B 17/14
U.S. Cl. 34—65 8 Claims



1. Apparatus for the slow cooling of grain comprising:
a silo having an upper and a lower end,
means for introducing heated grains into the silo upper end, the grain moving toward the silo lower end,
means for introducing cooling air into said silo adjacent the lower end thereof,
means for evacuating the cooling air at a point intermediate the silo upper and lower ends, said cooling air evacuating means defining a non-ventilated space between said cooling air evacuating means and the silo upper end in which internal moisture of the heated grain is allowed to diffuse within the grain as the grain descends in the silo, and a space between the cooling air evacuating means and the lower end where the cooling air causes drying and cooling as the grain descends toward the silo lower end, and
means at the lower end of said silo for extracting the cooled grain comprising a plurality of downwardly pointing cones, wherein said cooling air introducing means comprises means spaced above inlets to said cones to direct the flow of cooling air into said cone inlets.

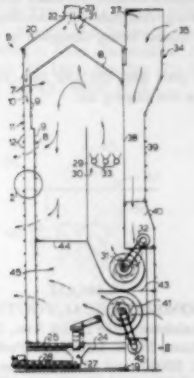
4,446,631

AIR SYSTEM FOR CONTINUOUS FLOW GRAIN DRYER

Elmo L. Batterton, and Melvin J. Lonsdale, both of Morton, Ill., assignors to Meyer Morton Company, Morton, Ill.

Filed Feb. 1, 1982, Ser. No. 344,499
Int. Cl.³ F26B 17/12
U.S. Cl. 34—65 11 Claims

1. In a continuous flow grain dryer especially useful for handling grain having a relatively high fines content, said dryer being of the type having means defining a vertical closed top plenum provided with forced heated air supplying means and being substantially surrounded by a vertical grain shower passage with means for delivering grain to be dried into the top of said passage, said plenum having a vertical air pervious wall providing the inner wall of said passage, and said passage having an air pervious outer wall spaced from said inner wall so that heated air is adapted to pass outwardly through said walls and traverse said passage for drying the showering grain and then exhausting into a discharge atmosphere zone contiguous to said outer wall, the improvement comprising:
a vertically extending air intake duct having an air intake chamber at its upper end projecting above the air pervious area of said outer wall, and said duct communicating at its lower end with said heated air supplying means;
an air inlet into said chamber and facing generally away from said outer wall and said discharge atmosphere zone toward an ambient atmosphere zone above and remote from said discharge atmosphere zone so that fresh air for delivery by said intake duct to said heated air supplying means is received by said inlet and which fresh air is as nearly as practicable free from fines that may be discharged with the spent drying air through said outer wall into said discharge atmosphere zone;



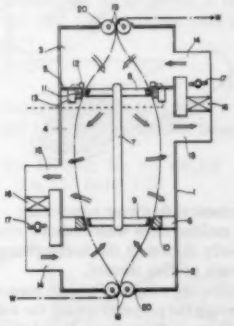
said duct extending down through said discharge atmosphere zone and having air impervious walls which shield the duct against entry of fines-containing air from said discharge atmosphere zone.

4,446,632

DRYING EQUIPMENT FOR TUBULAR TEXTILE WARES

Peter Dornier, Lindau, Fed. Rep. of Germany, assignor to Lindauer Dornier Gesellschaft mbH, Fed. Rep. of Germany

Filed Nov. 12, 1981, Ser. No. 320,739
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3048957
Int. Cl.³ F26B 25/00
U.S. Cl. 34—103 5 Claims



1. In drying equipment for tubular textile ware comprising a vertically floating circular expander adapted to spread the tubular ware from the inside, with drying air being blown from the outside into the tubular ware inside in a first zone and evacuated from the inside to the outside in an adjacent second zone,
the improvement which comprises
(a) three zone means consecutive in the direction of motion of the ware, said zone means being mutually bounded by partition means transverse to the direction of motion of the ware and surrounding the circular expander, and being located in the area of an entry part of said expander

spreading the tubular ware and a corresponding exit part of said expander, each of said entry and exit parts being in a substantially common plane with an associated partition means,

(b) magnetic means, adapted to keep the circular expander floating, at least at one of said partition means,

(c) the zone means located between the entry part and the exit part being designed as a suction chamber and the outer zone means being designed as blowing chambers, and

(d) the entry part and the exit part including axial flow openings for the drying air.

4,446,633

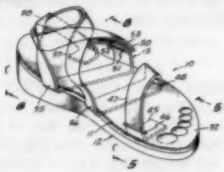
BIOMECHANICAL FOOTWEAR

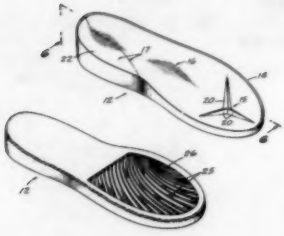
Myron G. J. Scheinhaus, 3918 Libbit Ave., Encino, Calif. 91316; Paul R. Jacobson, 354 S. LaFayette Park Pl., Apt. 304, Los Angeles, Calif. 90057, and Allen J. Selner, 3918 Libbit Ave., Encino, Calif. 91316

Filed Jun. 4, 1982, Ser. No. 384,894

Int. Cl.³ A43B *03/12, 13/00*

U.S. Cl. 36—11.5 **18 Claims**





17. Biomechanical footwear comprising:

an outsole molded from wear-resistant elastomeric material substantially thicker in the heel-forming position than in the forward portion thereof:

an insole including a layer of porous elastomeric material of a type having the property during the use of said footwear of taking a generally permanent set in conformity with the plantar surface of the wearer's foot;

means for holding said insole and said outsole inseparably assembled including means anchored thereto for holding the same to the wearer's foot; and

the major outer bottom portion of said outsole having a multiplicity of resilient arcuate ribs molded therein of generally V-shape in cross section each having a center spaced outwardly from the inner lateral edge thereof which ribs are slightly inclined toward said inner lateral edge of said outsole and adapted to partially collapse during pushoff to minimize resistance to supination of the wearer's foot and leg.

4,446,634

FOOTWEAR HAVING IMPROVED SHOCK ABSORPTION

Paul H. Johnson, 2526 W. Newton, Tulsa, Okla. 74127, and Robert B. Stevenson, 6713 E. 66th St., Tulsa, Okla. 74133

Filed Sep. 28, 1982, Ser. No. 425,437

Int. Cl.³ A43B *13/18, 13/20, 13/40*

U.S. Cl. 36—29 **3 Claims**

1. Footware having improved shock absorption means comprising:

a shoe having a heel, a box portion and a sole;

a first flat elastomeric bladder supported by said shoe heel portion to bear, at least in part, the weight of the heel portion of the foot of a user;

a second flat elastomeric bladder supported by said shoe box portion to bear, at least in part, the weight of the ball portion of the foot of a user;

a first and second conduit channel connecting said first and second bladders;

means of introducing fluid into said bladders;

a separate valve means in each of said channels; and

a check valve in one channel preventing fluid flow from said first to said second bladder and a check valve in the other channel preventing fluid flow from said second to said first bladder, thereby providing means to independently control the rate of fluid flow in both directions between said bladders.

4,446,635

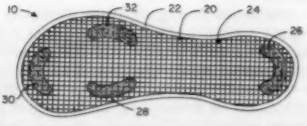
ICE-CREEPER TYPE OVERSHOE

Donald W. Hayden, Jr., 1811 Dixon Rd., Baltimore, Md. 21209

Filed Apr. 15, 1983, Ser. No. 485,427

Int. Cl.³ A43B *5/00;* **A43C** *15/10, 15/06*

U.S. Cl. 36—116 **10 Claims**



1. In footwear of the type which flexes as the user walks and which has: a vamp, a sole which flexes during said walking and has a top, upright sides and bottom with heel and toe areas, means for assembling the vamp and sole; and wire mesh type means for preventing slipping, attached at the sole; the improvement comprising: the wire mesh type means for preventing slipping including: the bottom of the sole having thereon a substantially loose covering of aluminum flyscreen for shedding ice and snow from the bottom of the footwear, including attachment of the substantially loose covering of aluminum flyscreen permitting flexing the substantially loose covering of aluminum flyscreen in response to flexure of said sole, said substantially loose covering of aluminum flyscreen attached

around the upright sides of said sole but being free of attachment to the bottom of the sole, means on said substantially loose covering of aluminum flyscreen for maintaining traction on smooth, hard tile floors and the like, and said attachment around the upright sides comprising said substantially loose covering of aluminum flyscreen having connective portions extending up around said upright sides and on the top of a flap portion of said sole extending horizontally around said vamp.

4,446,636

OCEANIC MINING SYSTEM

Friedrich Weinert, 219-19-131 Ave., Jamaica, N.Y. 11413

Filed Sep. 7, 1982, Ser. No. 415,320
Int. Cl.³ E02F *5/00*
U.S. Cl. 37—54 **4 Claims**

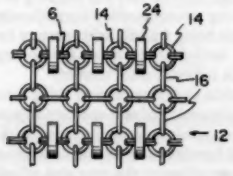
1. An oceanic mining system comprising a sea bulldozer movable across the bottom of the ocean by means of driven wheel to scrape up sediment from the ocean floor, said wheels being driven by an engine of the type which uses electrolysis to convert sea water into hydrogen and oxygen and then ignites the hydrogen and oxygen to provide power for driving the engine output, a mobile material transporting platform having a loading edge for receiving sediment from the bulldozer, means to raise the mobile platform to the surface of the ocean and lower it to the bottom including a cable and winch system mounted on at least one ship with the cables attached to the platform, a cargo ship for receiving material from the platform, said cargo ship having a material receiving opening, cable and winch means on said cargo ship with the cable attached to the end of the platform opposite the loading edge for maneuvering said loading edge of said platform into cooperative relationship with said opening for dumping said material into said cargo ship, said bulldozer being remotely controlled from a ship by means of cables to supply power needed for operation thereof.

4,446,637

CHAFING GEAR FOR FISHING DRAG

Thomas Ferreira, 9 Westhill Rd., Mattapoisett, Mass. 02739

Continuation of Ser. No. 211,261, Nov. 28, 1980, abandoned. This application Jan. 10, 1983, Ser. No. 457,014
Int. Cl.³ E02F *5/00*; A01K *73/02*
U.S. Cl. 37—55 **6 Claims**



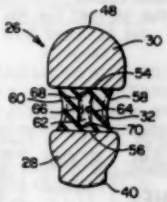
1. The combination of a fisherman's drag and chafing gear, the drag having an open end, a closed end, at least a first ring and a second ring and a midline extending from the open end to the closed end, the first and second rings connected together by a first link, the chafing gear comprising a first disk, the first disk including a surface and having an aperture centrally formed therethrough at right angles to the surface of the disk, the aperture having a wall defining the same, the wall circumscribing a portion of the first link and the surface of the disk being in parallel relation to the midline.

4,446,638

DIPPER TIP RETAINING PIN

Raymond J. Novotny, Sparta, and James P. Mulder, Oakland, both of N.J., assignors to Abex Corporation, Stamford, Conn.

Filed Dec. 27, 1982, Ser. No. 453,437
Int. Cl.³ E02F *9/28*
U.S. Cl. 37—142 A **2 Claims**



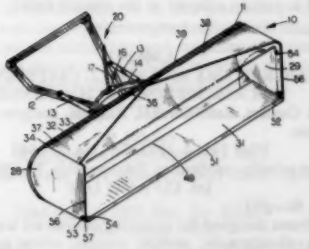
1. A pin for insertion into the pin receiving holes of a tip and the pin receiving hole of an adapter to retain the tip on the adapter which comprises: a U-shaped lock member including an elongated central body and a pair of legs which project one from each end of the body; a wedge member which is shorter than the distance between the legs and the legs overlie the wedge member; a resilient member which has a first pair of side walls of which one is bonded to the central body of the lock member and the other is bonded to the wedge member, a second pair of outer side walls which are positioned between the first pair of walls and extend between the lock member and wedge member, and means to collapse the second pair of walls inwardly when the resilient member is compressed upon insertion of the pin into the adapter and tip holes including a single centrally located sealed cavity formed within the resilient member, the surface defining each of the second pair of outer walls being concave such that the midpoints of the walls are spaced closer together than the ends of the walls adjacent the first pair of walls.

4,446,639

ANGLING SNOW BLADE

Donald L. Bohn, 7429 Glenvale Dr., Omaha, Douglas County, Nebr. 68134

Filed Jul. 22, 1982, Ser. No. 400,825
Int. Cl.³ E01H *5/06*
U.S. Cl. 37—280 **6 Claims**



1. A blade for clearing snow of a type having a vertical cross-sectional conformation of a generally circular segment to which pushing, angling and lifting means are attached, the improvement comprising a left and right side panel disposed

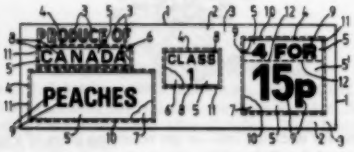
substantially normal to said blade, each having hinging means for pivoting it, independent of the other, about the top edge of the blade, whereby each panel can be held at a lower position to block the snow around the adjacent side edge of the blade and pivoted upwardly to a position permitting the escape of snow, wherein each side panel is attached to its hinging means by a top panel, one side of which extends along the adjacent one-half length of the top edge of the blade and another side of which extends along the top edge of the side panel.

4,446,640

PRICE TICKET AND LIKE DISPLAYS

George H. W. Kenney, Wimbledon, England, assignor to Richard Kenney, Toronto, Canada

Filed Feb. 18, 1982, Ser. No. 349,870
Int. Cl.³ G09F 3/18
U.S. Cl. 40—16.2 **5 Claims**



1. A price ticket or like assembly comprising in combination:
(a) a transparent support panel which is sufficiently resilient to be flexed, a ticket holder including parallel channels into which said panel is inserted and springs back upon release, whereby opposing edge portions of said panel locate within said parallel channels of said ticket holder, said panel having display matter printed thereon but with at least one area left clear to form a window, said support panel having, at least in each window area on the side adjacent to the ticket holder, a highly polished surface.
(b) components of soft plastic material having a highly polished surface, each component being self-adherent, positioned within and conveying an item of information and readable through a particular window,
(c) a setting panel comprising a rigid board, printed with an outline defining a location zone for each self-adherent component, each zone having associated therewith a discrete area to which the selected component is temporarily adhered, whereby when the side of the support panel normally adjacent the ticket holder is brought into surface-to-surface contact with the setting panel having components adhered thereon, application of pressure causes the surface of each component on the setting panel to adhere to a particular window of the support panel, removal of the support panel from the setting panel causing the components to be plucked from the setting panel and to remain adhered to the support panel.

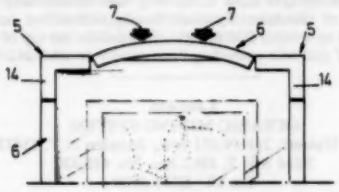
4,446,641

ALTERABLE FRAME AND SMALL FASTENING BLOCK FOR ASSEMBLING SUCH A FRAME

Marijke Cossaert, Kasteelbrakel, Belgium, assignor to Lineair, Belgium

Filed Feb. 2, 1982, Ser. No. 344,942
Claims priority, application Belgium, Feb. 27, 1981, 887715
Int. Cl.³ A47G 1/06
U.S. Cl. 40—152 **15 Claims**

1. A frame designed for mounting desired art works such as pictures, photographs, mirrors, posters, prints and the like, which are fastened between a front glass pane and a bearing panel, comprising a series of fastening blocks mounted at an interval from one another on the panel edges by means of a screw, the axis of said screw lying substantially at right angle to the panel with the free screw end entering a corresponding recess provided adjacent the panel edges, a plurality of flexible U-shaped sections being clamped over the panel edges with each section extending over the whole length of said edge



between two successive fastening blocks, these sections being slightly longer than the distance separating succeeding blocks, so that the ends of each of said sections press against the blocks.

4,446,642

PERIPHERAL DECORATIVE ARTICLE

John P. Chap, Lemont, Ill., assignor to Selfix, Inc., Chicago, Ill.

Filed Sep. 30, 1982, Ser. No. 431,816
Int. Cl.³ G09F 1/12
U.S. Cl. 40—152.1 **8 Claims**

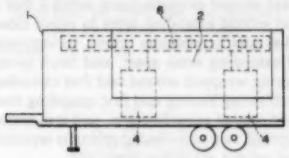
1. An integral decorative framing member adapted to be placed around and frictionally retained on a generally rigid article being framed comprising:
a decorative external portion defining front and outer decorative surfaces; and
an inner article engaging portion for engagement with the outer peripheral surface of the article being framed;
said inner article engaging portion being integral with and joined to said front surface and defining an aperture therewithin having a configuration corresponding to the shape of the article being framed, said aperture having a variable dimension between the inner article engaging portion disposed on opposite sides thereof;
said inner article engaging portion being tapered to define a maximum dimension of said aperture adjacent the junction of said inner article engaging portion with said front surface of said framing member and a minimum dimension of said aperture adjacent the rear end of said inner article engaging portion;
said inner article engaging portion being formed as a plurality of discrete segments having flexibility permitting passage of said framing member around said article without distortion of said front and outer decorative surfaces and resiliency to effect a gripping force for retaining said framing member in place on said article.

4,446,643

MOVABLE LARGE DISPLAY DEVICE

Shozo Fujita; Shunichi Futatsuishi, and Takashi Takushima, all of Nagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1982, Ser. No. 399,585
Claims priority, application Japan, Jul. 20, 1981, 56-108453
Int. Cl.³ G09F 21/04
U.S. Cl. 40—590 3 Claims



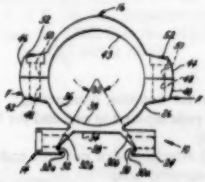
1. A large movable display device comprising a hollow display device body, a light emitting section provided on an external surface of said display device body for displaying characters and images, air conditioning means provided inside said display device body for blowing cooling air over the rear surface of said light emitting section for cooling said light emitting section, external air inlet means and external air outlet means located in an external surface of said body adjacent said air conditioning means, cover means provided for said external air inlet means and said external air outlet means for selectively opening and closing said inlet and outlet means to control the flow of external air for cooling said air conditioning means, removable separator panel means disposed in said display device body in spaced relation to said rear surface of said light emitting means to define a cooling passage between said panel means and said light emitting display section and duct means extending from said air conditioning means and having cooling air outlet disposed at the top of said cooling air passage above said separator panel means whereby said cooling air is directed through said duct means and then downwardly through said cooling air passage.

4,446,644

TELESCOPE SIGHT MOUNT SYSTEM FOR FIREARMS

Ivan Jimenez, and Irving N. Rubin, both of 5555 Treadwell, Wayne, Mich. 48184

Filed Dec. 2, 1981, Ser. No. 326,636
Int. Cl.³ F41G 1/38
U.S. Cl. 42—1 ST 4 Claims



1. In a firearm telescope sight mount system the combination comprising a longitudinally extending base adapted to be mounted on a firearm, a one-piece non-see-through type mount engaging said base, and a semi-circular clamp on said mount, said mount comprising a semi-circular receptacle portion and a base-engaging portion, said base-engaging portion engaging said base, said semi-circular receptacle portion cooperating with said semi-circular clamp so as to be adapted for embracing the body of a telescope sight, said base being constructed and arranged to have a slide portion having a transverse shape in the form of a general dovetail shape, said base-engaging portion being constructed and arranged to have a channel of generally complementary dovetail shape whereby the mount and base can be assembled together only by axially sliding the mount onto the base, said base-engaging portion engaging said slide portion of said base at longitudinally extending, transversely spaced apart sides of said slide portion, said base-engaging portion being constructed and arranged so as to integrally merge into said semi-circular receptacle portion in transversely inwardly set relation to said sides within a subtended acute angle with respect to the longitudinal axis of the receptacle portion, said channel also subtending an acute angle with respect to the longitudinal axis of the receptacle, and said angle subtended by the merger of said base-engaging portion with said receptacle portion being wholly included within the angle subtended by said channel.

4,446,645

CARTRIDGE MAGAZINE AND FOLLOWER FOR AUTOLOADING FIREARMS

Charles C. Kelsey, Jr., Chesterland, Ohio, and Walter C. Wolff, Berwyn, Pa., assignors to Devel Corporation, Chesterland, Ohio

Filed Feb. 12, 1982, Ser. No. 348,663
Int. Cl.³ F41C 25/02
U.S. Cl. 42—50 7 Claims

1. An improved box-type cartridge magazine for an autoloading firearm of existing design comprising

a magazine tube closed at one end and having substantially the same dimensions as the corresponding magazine tube for said existing design,

a modified cartridge-follower spring formed of coiled spring-wire having a solid height which is less than that of the corresponding follower spring for said existing design,

a cartridge follower comprising a cartridge-engaging portion and means for positioning and guiding said portion extending longitudinally of said magazine tube toward the closed end thereof,

said cartridge-engaging portion comprising a leaf-spring which is resilient relative to said positioning and guide means such that it yields longitudinally of said magazine as cartridges are loaded into said magazine, said positioning and guide means being formed integrally with said cartridge-engaging portion at one end thereof.

4,446,646

RETRACTABLE LANDING NET

Cecil W. van't Veld, 2301 Musgrove Rd., Silver Spring, Md. 20904

Filed Aug. 4, 1981, Ser. No. 289,989
Int. Cl.³ A01K 77/00
U.S. Cl. 43—12 14 Claims

1. A telescopable, retractable landing net for fish comprising a handle having a hollow interior and an open forward end, and a slot extending along a substantial portion of the length thereof;

a slide block of external size and shape approximately the

same but slightly smaller than the internal size and shape of said hollow handle, said slide block being slidable within said hollow handle, and a control handle projecting from said slide block and through said slot to the exterior of said hollow handle;

a resilient net supporting hoop formed of flexible material and connected to the forward end of said slide block by hinge means for collapsing said hoop so that said hoop will slide within the hollow of said hollow handle, said hoop having a hinge spaced approximately 180° from said hinge means, said hoop further having a generally smooth outer surface and generally smooth upper and lower edges,

net-supporting hook means solely along the interior periphery of said hoop, said net-supporting hook means comprising a series of integral, net-retaining resilient hooks each

of which extends upwardly from a point at or above said lower edge generally parallel to the interior peripheral surface of the hoop and terminating below the upper edge of said hoop, said series of hooks being spaced substantially entirely about said interior periphery of said hoop, and

a net removably attached by said resilient net-supporting hooks to said hoop by having loops of said net hooked directly over said series of hooks;

whereby upon grasping said control handle and sliding said slide block to the forward end of said hollow handle, said hoop and net are placed in fully open operating position, and upon sliding said slide block from said forward end of said hollow handle backwardly, said hoop becomes compressed and, along with said net, retracted within the hollow of said hollow handle.

4,446,647

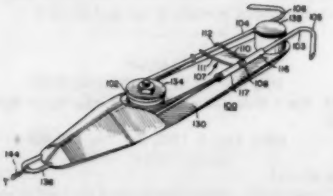
SPRING LOADED FISH HOOK

Manfred E. Kahl, P.O. Box 367, Northport, N.Y. 11768

Continuation-in-part of Ser. No. 281,568, Jul. 9, 1981, Pat. No. 4,387,528, which is a continuation-in-part of Ser. No. 134,108, Mar. 25, 1980, abandoned. This application Mar. 7, 1983, Ser. No. 472,743

Int. Cl.³ A01K *83/02*

U.S. Cl. 43—36 **13 Claims**



1. A fish hook assembly comprising:

an arm-biasing spring and first and second extending arms, said arm-biasing spring biasing said first and second extending arms apart; first and second hooks respectively disposed on said first and second extending arms; a latch spring mounted to said first extending arm, said latch spring having a first extending member with a hook portion at an end, said hook portion operative to hold said second extending arm compressed relatively close to said first extending arm, said hook portion adapted to release said second extending arm when a fish causes said first and second extending arms to move closer together, and said latch spring is operative to snap said hook portion away from said second extending arm when a fish causes said first and second extending arms to move closer together such that said arm-biasing spring springs said first and second extending arms apart, said latch spring is a coil latch spring wrapped around said first extending arm, said coil latch spring biasing said first extending member away from said second extending arm, said arm-biasing spring is a coil spring, said arm-biasing spring is separate from said first and second extending arms, and

wherein said arm-biasing spring is disposable in:

(i) a biasing position in which is opposes movement of said second extending arm towards said first extending arm, and

(ii) a non-biasing position in which said second extending arm may freely move towards said first extending arm without loading said arm-biasing spring.

4,446,648

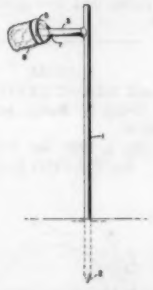
BAIT POST

Roy Teranishi; Edwin L. Murphy, both of Albany, Calif.; Donald S. Balser, Stanwood, Wash., and Walter E. Howard, Davis, Calif., assignors to The United States of America as rperesented by the Secretary of Agriculture, Washington, D.C.

Filed Jul. 29, 1981, Ser. No. 288,259

Int. Cl.³ A01M *25/00*

U.S. Cl. 43—131 **3 Claims**



1. A bait post for coyotes, comprising:

(a) a vertical pole tapered at one end for facile insertion into the ground;

(b) a side arm attached at or near the end of said pole opposite the so-tapered end;

(c) a holder attached to said side arm; and

(d) a solid substrate held by said holder which comprises an inner pouch for holding effective amounts of coyote control agents, a middle pouch made of material having mechanical strength sufficient to prevent a coyote from ripping it off said holder and an outer pouch made of a material simulating a substance familiar to coyotes; and wherein said pole has a length such that after firm insertion into the ground, the distance from ground level to said side arm is short enough so that coyotes can reach said side arm and said solid substrate and tall enough so that small animals cannot reach said side arm and said solid substrate and the distance of said side arm to the end

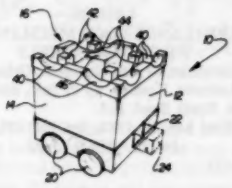
opposite the so-tapered end of said pole is sufficiently short so as not to frighten coyotes and wherein said holder secures said solid substrate so coyotes cannot remove it.

4,446,649

MOBILE BLOCKS

Walter Moe, 13039 Skyvalle Rd., Los Angeles, Calif. 90049, and Charles M. Diker, c/o Diker Moe, 1 New York Plz., New York, N.Y. 10004

Filed Oct. 16, 1981, Ser. No. 311,937
Int. Cl.³ A63H 7/02, 7/00
U.S. Cl. 46—218 10 Claims



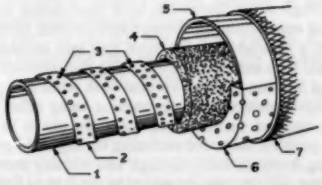
1. Apparatus comprising a block for use in forming an assembly of blocks which can be coupled together to form a train and which can be stacked on top of one another, said block having a bottom portion with wheels which can roll in order to move the block, said block having a top portion with means for supporting the bottom portion of another block of similar construction and for minimizing relative lateral shifting of the block supported thereon so as to allow stacking of the blocks, a coupling member movably connected to said block, said coupling member being movable between a retracted position and a protracted position in which it projects partly from said block for engaging a recess in another block to join the blocks into a train, said block including a slot and said coupling member is supported for movement in said slot, said coupling member being dimensioned so as to be disposed completely in said slot when in said retracted position and to project out of one portion of said slot and create a recess in another portion of said slot for receiving a coupling member from another block when in said protracted position.

4,446,650

HERBICIDE APPLICATOR

Douglas D. Davis, 1721 E. 7th St., Hopkinsville, Ky. 42240

Filed Aug. 25, 1982, Ser. No. 411,520
Int. Cl.³ A01G 13/00
U.S. Cl. 47—1.5 10 Claims



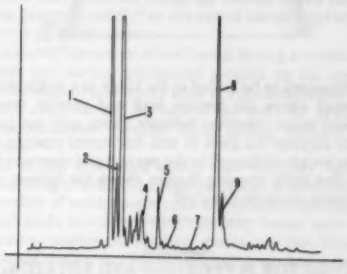
1. An apparatus for applying herbicides to plants comprising
(a) perforated tubing spirally wound around a rigid tube,
(b) means for introducing herbicide into the perforated tubing under pressure, and
(c) an absorbant cover over the entire tubing and rigid tube assembly.

4,446,651

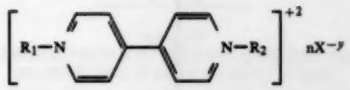
METHOD OF INCREASING EXTRACTABLE CEDARWOOD OIL FROM JUNIPERUS MEXICANA

Seymour J. Spitz, Jr., New York, N.Y.; Braja D. Mookherjee, Holmdel, N.J.; Ira D. Hill, Locust, N.J.; Lloyd F. Keleher, Rumson, N.J.; Robert W. Trenkle, Bricktown, N.J., and Robin K. Wolff, Point Pleasant, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

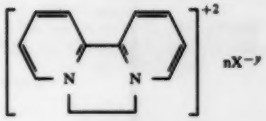
Continuation-in-part of Ser. No. 399,068, Jul. 16, 1982, abandoned. This application Aug. 19, 1982, Ser. No. 409,701
Int. Cl.³ A01G 23/10
U.S. Cl. 47—10 12 Claims



1. A method of chemically inducing the production of increased quantities of high thojopsene cedarwood oil within living *Juniperus Mexicana* trees by treating living *Juniperus Mexicana* trees with at least one bipyridylium salt having a structure selected from the group consisting of:



and



wherein R_1 and R_2 are the same or different and each represents C_1–C_4 lower alkyl; wherein n=1, y=1 and the product of n and y is 2 and wherein X represents chloride, bromide, fluoride, iodide, sulfate, nitrate, hydroxyl or methyl sulfate; permitting the so-treated *Juniperus Mexicana* trees to grow for a time of between 2 months and 18 months; harvesting the resulting *Juniperus Mexicana* trees; and extracting high thujopsene-containing cedarwood oil from the thus-harvested trees, the concentration of bipyridylium salt being between 0.15% and 40%.

4,446,652

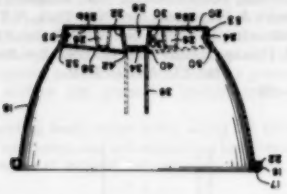
UNITARY FLOWER POT

Dennis C. Anderson, Northfield, Minn., assignor to National Polymers, Inc., Lakeville, Minn.

Filed Sep. 28, 1982, Ser. No. 425,971
Int. Cl.³ A01G 9/02
U.S. Cl. 47—66 9 Claims

1. A unitary flower pot including a flower pot body having a side wall and an upper free edge defining an upper open mouth, a horizontal bottom wall at the lower edge of the side wall closing the lower aspect of the pot, at least one swinging

soil support plate hinged to the pot and said plate having an elevation above the bottom wall to define a water storage reservoir therebetween, a horizontally disposed living hinge connection between the plate and the body of the pot, said pot being formed from moldable plastic resin and being formed with said plate in a substantially vertical position, said plate



being connected to be folded at the hinge to a horizontal position spaced above the bottom wall and parallel thereto to define said water reservoir between them, said pot having a means to support the plate in said horizontal position and to resist the weight of the soil in the pot and said reservoir having at least one drain opening therein above the bottom wall to allow excess water to drain off.

4,446,653

DEVICE FOR SUPPORTING AND ROTATING A HANGING PLANT

Robert H. Morgan, Jr., 22 Birch Rd., Darien, Conn. 06820

Filed May 4, 1981, Ser. No. 260,391
Int. Cl.³ A47G 7/02
U.S. Cl. 47—67 **4 Claims**

1. A device for supporting a hanging plant object with respect to a fixed object and for slowly rotating the plant object to expose different sides to sunlight, the device consisting essentially of:

a cord having one end for attachment to said fixed object and having another end for attachment to said plant object, said cord being longitudinally extensible in response to an increase in the weight of said plant object and being longitudinally contractable in response to a decrease in the weight of said plant object, said cord including an elongate elastic core, said core being twisted about its longitudinal axis in one direction, and a flexible substantially inextensible length, said length being wound about said core in a generally helical pattern along the longitudinal axis of the core in a direction opposite to the direction said elastic core is twisted, said inextensible length having one end attached to one end of the twisted core and having another end attached to an opposite end of the twisted core, said elastic core being maintained in said twisted condition by said inextensible length when said cord is not supporting said plant object, upon an increase in weight of said plant object said elongate elastic core extending in length and twisting more tightly and said inextensible length unwinding thereby rotating the plant object in one direction, and upon a decrease in weight of said plant object said elongate elastic core contracting in length and untwisting and said inextensible length winding thereby rotating said plant object in a direction opposite said one direction; and

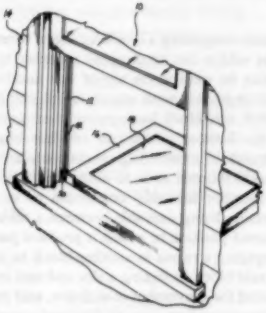
means secured to each end of said cord for supporting said plant object and attaching said fixed object.

4,446,654

COUNTERBALANCE LOCK MECHANISM FOR A WINDOW ASSEMBLY

William K. Schoolman, Wyatt; George A. Grilman, Osceola, and Frank D. Andrews, Bremen, all of Ind., assignors to Mastic Corporation, South Bend, Ind.

Filed Sep. 29, 1982, Ser. No. 427,973
Int. Cl.³ E05D 15/22
U.S. Cl. 49—181 **3 Claims**



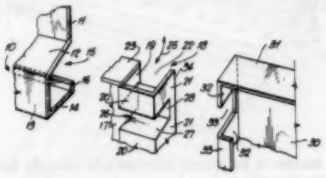
1. In a window assembly having a frame including spaced jamb members, a sash carrying a window glazing panel slidably mounted for vertical movement within said jamb members, and a sash weight balancing mechanism carried by at least one of said jamb members, said balancing mechanism including a block shiftable vertically along the one jamb member and a tensioned cord connected to the block, said sash being carried by said block for vertical and tilting movement relative to said one jamb member, said tensioned cord constituting means for balancing the weight of said sash as it slides within said one jamb member, the improvement wherein said one jamb member includes a housing member fixedly located within the one jamb member, said housing member having a vertical bore therethrough and a horizontal bore intersecting the vertical bore, said cord extending through said housing member vertical bore, a rotative lock pin fitted into said housing member horizontal bore and having an opening therethrough alignable with said housing member vertical bore when said pin is in a first rotative position, said pin opening being offset from said housing member vertical bore when the pin is in a second rotative position, said cord extending through said pin opening and being freely shiftable through said housing member horizontal bore and pin opening when the pin is in its first position, said cord being twisted about said pin and secured against movement through said housing member horizontal bore when said pin is in its second position to isolate said block from the weight balancing influence of said weight balancing mechanism, said pin including accessible means for turning the pin between its said first and second rotative positions.

4,446,655

WEATHERPROOF DOUBLE DOOR STRUCTURE, AND AN ENCLOSURE EMBODYING SUCH STRUCTURE

Peter P. Unterhoffer, Nepean, and Gilles L. Dufresne, Alymer, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Nov. 27, 1981, Ser. No. 325,304
Int. Cl.³ E06B 7/16
U.S. Cl. 49—368 20 Claims



1. A weatherproof sealing structure for a double door opening, said opening being unobstructed in an open condition and having first and second doors hingedly mounted at outer edges in a frame defining the sides of said door opening, said doors having contiguous inner edges when in a closed condition, said sealing structure comprising:

a continuous channel along the top of said door opening, the channel having an open side facing toward an outer surface and including a wall extending part way up said open side;

a channel at the inner edge of said first door and having an open side facing towards an outer surface of the door, the channel extending inwards from said outer surface, and an inturned upper edge on said first door;

an inturned inner edge and an inturned upper edge on said second door, said inturned inner edge entering said channel at the inner edge of said first door, in a closed condition;

a recess extending into said channel at said inner edge of said first door, the recess extending from an inner surface of said channel and positioned to admit the low wall of said continuous channel, said inturned upper edge of said first door entering said continuous channel, in a closed condition;

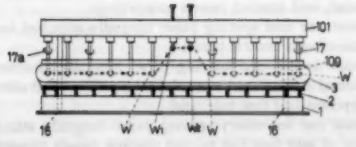
a slot in the inturned inner edge of said second door, said slot fitting over said recess in said channel of said inner edge of said first door and said inturned upper edge of said second door entering said continuous channel on closing of said second door on to said first door.

4,446,656

LONG-TRAVEL ANNULAR VIBRATORY BARREL FINISHING APPARATUS FOR LINE-PROCESSING

Hisamine Kobayashi, Nagoya, Japan, assignor to Kabushiki Kaisha Shikishima Chipton, Nagoya, Japan

Division of Ser. No. 137,441, Apr. 4, 1980, Pat. No. 4,317,313. This application Dec. 30, 1981, Ser. No. 335,665
Int. Cl.³ B24B 19/00
U.S. Cl. 51—7 9 Claims



1. A long travel vibratory barrel finishing apparatus for line processing of workpieces to be finished, said vibratory finishing apparatus comprising:

an elongated vibratory barrel having two opposed semicircular barrel outer wall segments and straight barrel outer wall segments extending therebetween to form an oval path, said barrel having a length from 5 to 15 times the width in the direction transverse to the straight barrel outer wall segments, and said barrel having a cross-section transverse to the length thereof which is symmetrical about the center of the cross-section and at least the lower part of which is substantially circular and which is open at the top thereof;

a plurality of springs supporting the bottom of said vibratory barrel and extending along the bottom of the barrel in a line generally parallel to the axis of the circular cross-sectional portions;

a vibrator at the center of said barrel having a vertical rotary shaft and having unbalanced weights on the upper and lower ends of said rotary shaft at a predetermined angle to each other around the axis of the shaft for producing a predetermined vibration force during rotation of said shaft;

guide means positioned above said vibratory barrel and extending around the entire perimeter of said oval path;

a plurality of workpiece supporting spindles depending from said guide means into said vibratory barrel, said spindles having workpiece holding means on the lower ends thereof within said barrel and being vertically slidable in said guide means;

means for sliding said spindles upwardly in order to raise finished workpieces completely out of said vibratory barrel before removing and replacing such finished workpieces from the lower ends of the spindles; and

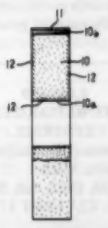
spindle drive means connected to said spindles for moving the spindles along said guide means and simultaneously for rotating the spindles around the longitudinal axes thereof.

4,446,657

RESINOID BONDED GRINDING WHEEL AND METHOD FOR FORMING SUCH WHEEL

Toshio Asaeda, Tokyo; Ikuo Suzuki, Chiryu; Tomoyasu Imai, Kariya, and Masato Kitajima, Hekinan, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya and Toshio Asaeda, Tokyo, both of, Japan

Filed Jun. 9, 1981, Ser. No. 271,997
Claims priority, application Japan, Jun. 13, 1980, 55-83616[U]
Int. Cl.³ B24D 5/04
U.S. Cl. 51—206 R 18 Claims



1. A grinding wheel for use in a grinding machine which utilizes coolant during operation, said grinding wheel comprising:

(a) a support member made of porous ceramic;

(b) a grinding element mounted on said support member and constituting the working surface of said grinding wheel, said grinding element including hard grain elements distributed in a resinoid bonding matrix; and

(c) a coolant-impervious sealing layer formed on every surface of said support member except the surface on which said grinding element is mounted, said sealing layer

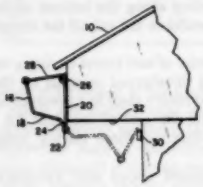
preventing penetration of coolant into said support member, whereby generation of vibrations due to imbalance of said support member caused by the presence of coolant in said support member during rotation of said grinding wheel is avoided.

4,446,658

FOLDING RAIN GUTTER CONSTRUCTION

Robert P. Gouin, Post Office, Halifax, Vt. 05358

Filed Oct. 17, 1980, Ser. No. 197,893
Int. Cl.³ E04D *13/06*
U.S. Cl. 52—11 **3 Claims**



1. A rain gutter for an associated building which comprises:
an elongated trough shaped member;
means for mounting said trough shaped member on the associated building in a position in which said member will hold at least temporarily a quantity of water;
said means for mounting allowing movement of said trough shaped member to a second position in which said trough shaped member will not hold water even temporarily and said trough shaped member is in substantially intimate contact with the associated building along substantially the entire axial extent thereof;
said trough shaped member comprises, at least in part, an elongated rigid member and hinge means for carrying said elongated rigid member;
said pivot axis of said hinged means is disposed in generally parallel relationship to an edge of the associated roof of the associated building;
said elongated rigid member comprises first and second generally planar axially elongated portions which intersect at an oblique angle; and said trough shaped member further includes a third portion which is generally planar and which carries said hinge means, said elongated rigid member further includes a fourth axially elongated generally planar portion which intersects said second portion thereof at an oblique angle and which in at least one relative position, said fourth portion and said third portion are disposed in generally parallel generally coplanar intimate contact.

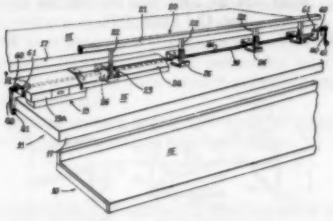
4,446,659

AUTOMATIC SEATING FOR TELESCOPING ROW SYSTEMS

Robert E. Quigley, Seymour, Ill., assignor to American Seating Company, Grand Rapids, Mich.

Filed Dec. 20, 1982, Ser. No. 451,348
Int. Cl.³ E04H *3/12*
U.S. Cl. 52—9 **23 Claims**

1. In a telescoping seating system having a plurality of rows adapted for movement between a use position in which said rows are in stepped relation and a storage position in which said rows are generally vertically aligned with a lower row nested beneath an upper row, each row including a deck and seating means including a frame pivotally mounted to said deck for movement between a raised use position and a lowered storage position, said frame carrying a seat for at least one occupant, the improvement comprising: drive rod means mounted for rotation to said deck; at least one actuation means connected to said drive rod means and adapted to be engaged by the next lower row when said next lower row is being retracted to rotate said drive rod means in a first direction; and latch means actuated by the rotation of said drive rod means in said first direction in response to the retraction motion of said next lower row for unlocking said frame and permitting said



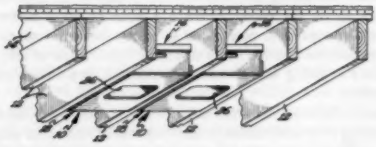
seating means to be stored substantially entirely between the decks of adjacent rows and actuated responsive to rotation of said drive rod means in a second direction for engaging said frame and locking same in a raised position.

4,446,660

STUCTURAL MEMBER STORAGE DEVICE

LeRoy Miller, Minneapolis; Stanley R. Thorud, Brooklyn Center, and Eric M. Rivkin, Minnetonka, all of Minn., assignors to Liberty Carton Co., Minneapolis, Minn.

Filed Jan. 29, 1981, Ser. No. 229,321
Int. Cl.³ A47B *5/00*
U.S. Cl. 52—36 **3 Claims**



1. A building storage system for location between and attachment to structural members of a building, said system comprising:
a container;
means for attaching said container between adjacent structural members; and
means for snugly and adjustably spacing said attachment means between said structural members, wherein said structural members are joists and said container is sized to fit between said joists and said attachment means comprises a central panel substantially the width of said container, said attachment means further comprising a plurality of spacing panels hingedly attached to said central panel, said spacing panels comprising:
at least one first spacing panel hingedly attached to a first side of said central panel;
at least one second spacing panel hingedly attached to a second side of said central panel, said second side being opposite said first side; and
at least one secondary spacing panel hingedly attached to one of said first and second spacing panels opposite said central panel, said spacing panels being selectively foldable to vary the effective width of said central panel.

4,446,661

SPACER MEANS FOR PROVIDING AIR GAPS

Jan U. E. Jonsson, Hantverksvägen 8, 184 00 Åkersberga; Rolf B. J. R. Blomgren, Lövängsvägen 131, 183 00 Täby, and Nils H. Edlund, Nybygget Sandemar, 130 54 Dalarö, all of Sweden

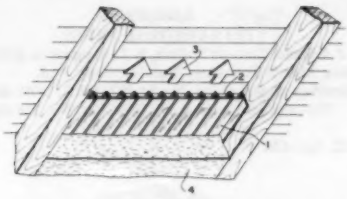
PCT No. PCT/SE80/00042, 371 Date Oct. 7, 1980, 102(e) Date Oct. 7, 1980, PCT Pub. No. WO80/01702, PCT Pub. Date Aug. 21, 1980

PCT Filed Feb. 12, 1980, Ser. No. 198,143

Claims priority, application Sweden, Feb. 19, 1979, 7901454

Int. Cl.[3] E04B *1/00*

U.S. Cl. 52—95 3 Claims



1. A spacer means for providing air gaps between a roof or ceiling and its insulation and having sufficient rigidity to support said insulation thereon comprising a sheet provided with corrugations which extend substantially the entire thickness of said air gaps, said sheet being formed so as to be resiliently compressible transverse to the longitudinal direction of said corrugations, whereby the spacer means is readily adjustable to fit a preexisting insulation without the necessity of being permanently fixed to structural members of said installation, and wherein the corrugations in their relaxed state are formed with alternate flat base portions and angular portions, united therewith, such that when the angular portions are compressed together, the sheet can be placed in its position of use between two roofing beams, while the flat base portions form a flat interconnecting surface to which an insulating layer can be applied, said compression of the corrugations transforming the sheet from a discontinuous surface of peaks and valleys to a substantially continuous surface.

4,446,662

TELESCOPIC VARIABLE LENGTH DEVICE

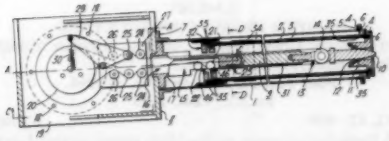
Martin E. Humphries, Bristol, England, assignor to British Aerospace Public Limited Company, London, England

Filed Apr. 8, 1981, Ser. No. 252,191

Claims priority, application United Kingdom, Apr. 11, 1980, 8011952

Int. Cl.[3] E04H *12/34*

U.S. Cl. 52—121 8 Claims



1. A telescopic boom comprising:

a support member,

a first elongate tubular boom section connected to said support member, and

a plurality of further elongate tubular boom sections,

said boom sections being at least partially nested one inside another when the boom is in a non-extended position and said further boom sections being movable relative to one another and to said first boom section in the longitudinal direction of the sections for the boom to move between said non-extended position and an extended position thereof, the boom further comprising a drive mechanism for moving the boom sections as aforesaid which drive mechanism includes:

an elongate flexible element,

support means fixed with respect to said support member and operable for supporting said flexible element so that it extends in said longitudinal direction near said first boom section and so that said flexible element is movable in the direction of its length, and

motor means coupled to the flexible element and operable for moving the flexible element in the direction of its length as aforesaid,

said further boom sections comprising respective engagement portions operable in sequence for engaging a cooperating engagement portion of said flexible member and for being moved by the flexible member to extend the associated further boom sections in corresponding sequence.

4,446,663

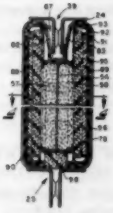
ACOUSTICAL PAD

William S. Stumpf, and Gary R. Ludwig, both of Kitchner, Canada, assignors to Hauserman Ltd., Waterloo, Canada

Filed Jan. 14, 1981, Ser. No. 224,892

Int. Cl.[3] E04B *1/82*

U.S. Cl. 52—144 31 Claims



1. A readily removable and replaceable acoustical pad for an interior space dividing system of the type having horizontal and vertical frames forming generally rectangular pad receiving windows, the upper horizontal frame of each window having back-to-back slightly spaced depending flanges substantially coextensive with the window forming a tongue, said pad having a substantially central upwardly opening V-shaped groove along the top edge thereof only, said groove being at least partially defined by a pair of oppositely inclined surfaces and adapted to mate with the tongue so that the pad may be inserted in the window by first mating the groove with the tongue and then pivoting the pad along its top edge into a snug fit in the window.

4,446,664

INSULATION SYSTEM

Daniel J. Harkins, 2200 W. Norfolk Ave., Norfolk, Nebr. 68701

Filed Mar. 23, 1981, Ser. No. 246,209

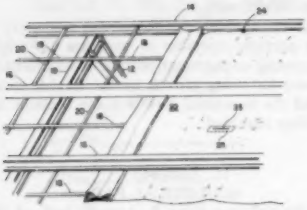
Int. Cl.[3] E04B *1/74*

U.S. Cl. 52—404 10 Claims

1. A suspension system for insulation of a building roof of the type comprised of two transverse end wall rafters supported by end wall corner columns, transverse rafters supported by rafter columns, longitudinal eave struts operably attached to the ends of said rafters, longitudinal beams positioned in parallel spaced relationship and operably attached to the upper surface of said rafters and roof sheeting material operably attached to the upper surface of said beams wherein the suspension system comprises:

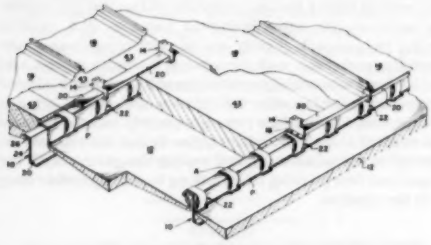
(a) spaced longitudinal metal bands suspended between the end wall rafters in touching contact with the upper surfaces of the transverse rafters;

(b) spaced transverse metal bands suspended between the eave struts below said longitudinal bands;
(c) transverse band fasteners means for attaching said transverse bands to the beams whereby said transverse bands and said longitudinal bands form a suspension grid-work;
(d) an independent suspension sheet means, comprising a vapor barrier material, operably positioned between said suspension grid-work, and the beams, said suspension sheet means extending longitudinally from one rafter to



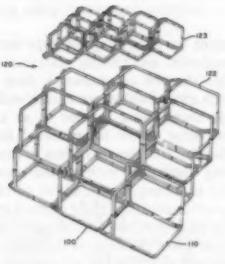
another and transversely from one eave strut below a plurality of longitudinal beams, said suspension sheet means being continuous but for the passage of said band fastener means therethrough, thereby separating said beams and rafters from the space below said suspension sheet means; and
(e) first insulation means positioned between the beams and below the roof sheeting material and operably supported on said suspension sheet means.

4,446,665
INSULATED ROOF STRUCTURE SYSTEM AND METHOD OF ERECTING SAME
Hans G. Berger, Burlington, Canada, assignor to The Wickes Corporation, Santa Monica, Calif.
Filed Dec. 2, 1981, Ser. No. 326,692
Int. Cl.³ E04B *1/78, 2/00*
U.S. Cl. 52—407 **12 Claims**



1. In a standing seam roof construction including a plurality of elongate parallel purlins, each having a vertical web and a horizontal top web projecting from one side of said vertical web at the upper edge thereof, standing seam roof panels supported by the purlins in overlying relationship therewith, a continuous blanket of deformable, squeezable insulating material spanning a plurality of said purlins and overlying and supported by said purlins; resilient generally inversely U-shaped clips for securing said blanket in overlying relation to said purlins, each clip comprising a horizontal top web section integrally joined at one end to a vertical web section and integrally joined at its other end to a downwardly directed web portion connected with a web loop portion having an upwardly directed web section and then a downwardly directed web section to resiliently enclose the upper portion of the purlin, the web sections of each clip being dimensioned relative to the webs of a purlin such that a blanket of said insulating material overlying a purlin is compressed against the top web of the purlin, and turned reversely by said loop portion, while being pressed against the vertical web of said purlin by the respective top and vertical web sections of said clip to clamp said blanket in position with the top and vertical web sections respectively of the clip opposed to and embracing the top and vertical webs of said purlin; said clips being installed along each of said purlins whereby the blanket in its extent between adjacent purlins is deformed below the tops of the purlins to form pockets between the purlins suitable for the reception of additional insulating material.

4,446,666
TETRAHEDRAL TRUSS
John J. Gilman, Convent Station, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.
Continuation-in-part of Ser. No. 54,497, Jul. 3, 1979, abandoned.
This application Dec. 15, 1980, Ser. No. 216,047
Int. Cl.³ E04H *12/00*
U.S. Cl. 52—648 **7 Claims**



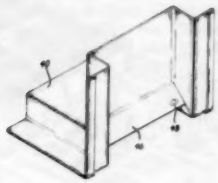
1. A structural element for constructing a tetrahedral truss in the pattern of cubic-diamond, comprising:
a closed skeletal-tetrahedric unit, said unit being comprised of four hexagonic triplanar-rings joined along the length dimensions of adjacently located and cooperatively mating sides thereof to form said unit each of said rings having six equilateral sides the intersections of which form included angles of about 109°, 28 minutes.
said ring having the configuration of a closed, triplanar pattern, and
the sides of said ring being adapted to cooperatively mate along the length dimensions thereof with adjacently located and similarly configured hexagonic triplanar-rings to form said unit.

4,446,667
DAMPER FRAME CONSTRUCTION
Robert C. Hertel, Grandview, Mo., assignor to Ruskin Manufacturing Company, Grandview, Mo.
Filed Jun. 14, 1982, Ser. No. 387,966
Int. Cl.³ E04C *2/38*
U.S. Cl. 52—658 **5 Claims**

1. A frame for a damper having blade means mounted on the frame for controlling fluid flow through a rectangular damper opening defined by the frames, said frame comprising:
an elongated, initially flat sheet member bent into longitudinally extending, generally inverted U shaped channel having a bight portion and a pair of integral, spaced apart leg portions projecting from the bight portion;
each leg portion having an integral flange projecting outwardly from its corresponding leg portion at an angle thereto;
a slot in the member for each frame corner respectively, each slot extending transversely across the member severing the bight and leg portions thereof, said slots being in

dispositions to define the lengths of the longitudinal frame sections;

a pair of spaced apart notches in the bight portion for each frame corner, said notches extending longitudinally of the bight portion and comprising a pair of parallel slits, there being a slit for each edge of the bight portion, each slit extending from the slot in the bight portion and parallel with its bight portion edge adjacent to the latter and communicating with the corresponding slot to define a flap in the bight portion material;



one of said slots extending through said flanges to sever the member at a length suitable for the frame periphery;

the flanges proximal the remaining slots being bent to dispose each adjacent pair of frame sections at substantially right angles to thereby form the frame corners;

the opposed ends of the member being juxtaposed at the corner; and

means securing said flaps to the bight portion across the proximal slot to hold the sections in said right angle positions.

4,446,668

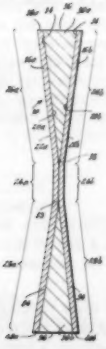
STRUCTURAL MEMBER SUITABLE FOR USE AS A JOIST, BEAM, GIRDER OR THE LIKE

Victor F. Christ-Janer, 4 Forest St., New Canaan, Conn. 06840

Continuation-in-part of Ser. No. 966,086, Dec. 4, 1978. This application May 15, 1981, Ser. No. 264,006

Int. Cl.³ E04C *3/30*

U.S. Cl. 52—729 **6 Claims**



1. An elongated joist, beam, girder or similar structural member, comprising:

first and second elongated plywood webs each having a generally arcuate cross-sectional shape and, thus, one generally convex surface and an opposing generally concave surface, said webs being disposed in generally mutually parallel relation with said convex surfaces in mutually confronting relation, one of said convex surfaces diverging from the other thereof in both an upper generally V-shaped region and a lower generally V-shaped region, said webs thereby defining two parallel spaced top edges and two parallel spaced bottom edges; and

upper and lower generally V-shaped structural wedges interposed between and conforming to said confronting convex surfaces of said first and second webs throughout their length in respectively said upper region and said lower region; and

adhesive means intimately and continuously joining each of said upper and lower wedges in the respective upper and lower regions with the V-shaped surfaces of said wedges intimately and continuously joined to the respective confronting convex surfaces of said first and second webs;

said upper wedge having a base substantially coextensive with and spanning the distance between said spaced top edges of said webs and together therewith defining an exposed upper load supporting surface, said lower edge also having a base substantially coextensive with and spanning the distance between said spaced bottom edges of said webs and together therewith defining an exposed base surface, said upper wedge consisting of a wood material selected from the group of wood materials capable of bearing substantial compression loads of at least about 950 pounds per square inch without structural failure in order to, together with the portions of said webs to which it is intimately joined by said adhesive means, accept and support load on said upper load supporting surface of said member in compression and said lower wedge consisting of a wood material selected from the group of wood materials capable of bearing substantial tension loads of at least about 950 pounds per square inch without structural failure in order to, together with the portions of said webs to which it is intimately joined by said adhesive means, accept and support load on said member in tension.

4,446,669

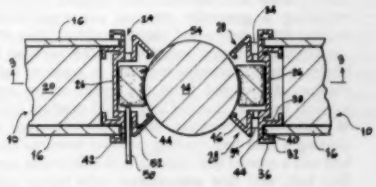
END CHANNEL MEMBER FOR SPACE DIVIDING SYSTEM PANEL

Burton L. Siegal, Skokie, Ill., assignor to Acme Steel Door Corp., Brooklyn, N.Y.

Filed Sep. 30, 1980, Ser. No. 192,541

Int. Cl.³ A47B *57/16*

U.S. Cl. 52—738 **3 Claims**



1. An end channel for an area dividing panel adapted to receive a bracket hook of a given thickness, said channel comprising:

an elongated member;

a central web section of said member;

a pair of recesses integrally formed at a transverse end of said web section;

one of said rececces being defined by a pair of spaced apart surfaces extending perpendicular to said web section and a base extending parallel to said web section;

the other of said recesses being defined by a pair of surfaces spaced apart at a distance substantially equal to the thickness of a bracket hook and extending in parallel to said web; one of said surfaces comprising the base of said one recess and the other of said surfaces including a wing portion extending therefrom at an angle of 45° from the web in the direction opposite to that of said web and other

recess; and a base for said other recess extending perpendicular to said web; and

a plurality of bracket hook slots disposed in said other recess base.

4,446,670

SYSTEM TO UNIFORMLY FILL CASES WITH FRUIT AND VEGETABLES

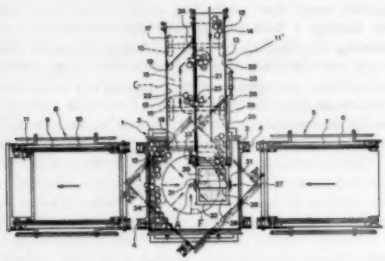
Felice Compagnoni, 1165 Via Emilia, 41018 San Cesario Sul Panaro, Modena, Italy

Filed Feb. 18, 1981, Ser. No. 235,714

Claims priority, application Italy, Mar. 3, 1980, 40015 A/80

Int. Cl.³ B65B *39/12, 25/04*

U.S. Cl. 53—244 **14 Claims**



1. A product filling system for uniformly filling cases with fruit, vegetables or the like, comprising:

(a) a case entrance conveyor;

(b) a rotating platform positioned on a base frame to receive an empty case discharged from the entrance conveyor, said platform being rotatable about a vertical axis to distribute product within the case;

(c) a case exit conveyor arranged to receive and convey filled cases away from the platform; and

(d) means for feeding product into a case positioned on the rotating platform, said means including an upper conveyor means and a generally vertical conveyor means arranged to receive product from said upper means and convey same into the case, said vertical conveyor means including a generally vertical conveyor belt passing around drum means and plural flexible blades attached in cantilevered, spaced locations to the vertical belt, said blades being upwardly inclined to receive and support product discharged from the upper means against the vertical belt and thereby lower said product into the case in controlled movement, said upper conveyor means including a first belt feeding product towards the vertical belt and a second belt moving in the direction opposite the first belt, said first and second belts being substantially coplanar with and laterally adjacent each other, and means located to recirculate product between the first and second belts to thereby direct product away from the vertical conveyor between filling operations of in line cases.

4,446,671

DEVICE AND METHOD FOR PACKING VARIOUS PRODUCTS IN BOXES

Heinz Stalder, Vufflens-La-Ville, Switzerland, assignor to Sapal, Societe Anonyme des Plieuses Automatiques, Switzerland

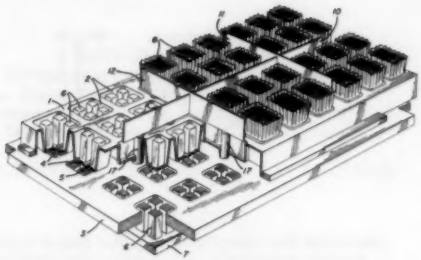
Filed Oct. 19, 1981, Ser. No. 312,805

Claims priority, application Switzerland, Oct. 21, 1980, 7840/80

Int. Cl.³ B65B *5/08, 35/38*

U.S. Cl. 53—445 **7 Claims**

1. Apparatus for packaging a plurality of products comprising a mold including a plurality of cavities, said cavities including an upper surface and a base portion for receiving said products, a plurality of product pushing means movable between a first position at said base portion of said plurality of cavities and a second position proximate to said upper surface of said plurality of cavities for elevating said products contained in said plurality of cavities to said second position, said mold including at least one slot formed between a plurality of said cavities and including an upper surface and a base portion for receiving a partition, and at least one partition pushing means movable between a first position at said base portion of



said slot and a second position proximate to said upper surface of said slot for elevating a partition contained in said at least one slot to said second position of said slot, wherein said plurality of product pushing means elevate said products and said at least one partition pushing means elevate said partition substantially simultaneously, whereby said products and said partition are substantially simultaneously placed in a position where they may be drawn together and transported together into a container.

4,446,672

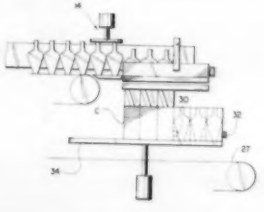
METHOD FOR DROP PACKING SMALL UNSTABLE ARTICLES

John L. Raudat, North Madison, Conn., assignor to Standard-Knapp, Inc., Portland, Conn.

Filed Aug. 31, 1981, Ser. No. 298,062

Int. Cl.³ B65B *35/32, 35/44*

U.S. Cl. 53—448 **3 Claims**



1. A method for drop packing unstable articles into upwardly open packing cases and comprising the steps of:

(a) feeding the articles on a conveyor in end-to-end relationship and in side-by-side columns to fill a drop packer grid of the type having side-by-side lanes for receiving the columns of articles at the downstream end of the conveyor whereby a charge of articles is provided in the grid, adjacent the downstream end of the conveyor,

(b) stopping the flow of articles on the conveyor after a predetermined number of articles have entered the grid whereby the charge of articles in the grid are segregated from those being fed toward the grid on the conveyor,

(c) mating a portion of the case with a funnel and dropping the charge of articles through the funnel so that only that

portion of the case is filled by the charge, and continuing to hold back the flow of articles on the conveyor,

(d) moving the case so that another portion is positioned below the grid to receive another charge, and mating that portion with the funnel,

(e) allowing the articles to again flow into the grid to form a second charge,

(f) dropping the second charge through the funnel and into the case to fill said another portion thereof.

4,446,673

BOTTLE-FILLING METHOD AND DEVICE

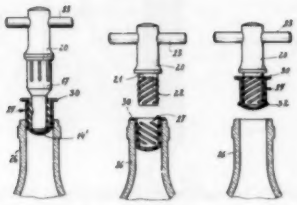
Johannes Desthieux, 1083, rue de Thizy, Gleize (Rhone), France

Filed May 14, 1982, Ser. No. 378,414

Claims priority, application France, May 15, 1981, 81 10095

Int. Cl.³ B65B *3/06, 7/28;* B67B *1/04, 7/02*

U.S. Cl. 53—467 **12 Claims**



12. A method of sealing and unsealing a bottle after filling same with a liquid decanted from a container through a tap attached to a spout of said container, said tap having a valve housing provided with a removable valve body which includes a tubular spigot and a handle separable from each other,

comprising the steps of:

providing a resiliently deformable cap with a closed lower end insertable as a stopper into the neck of a freshly filled bottle and with an open upper end slightly wider than said spigot, said handle having a stem receivable with a positive fit in said open end upon separation from said valve body;

introducing the spigot into said open end and, with the handle still attached to the valve body, using the combined handle and valve body as a tool for forcing the closed end of the cap down the neck of the bottle;

separating the handle from the valve body; and

subsequently introducing the stem of the handle into the open end of said cap for extracting same from the neck of the bottle with the aid of mating formations on said stem and in said cap.

4,446,674

CONTAMINATION-FREE APPARATUS FOR FILLING SPOUTED BAGS WITH A FLUID

Junji Inada, Tokyo, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Filed Feb. 2, 1981, Ser. No. 230,705

Claims priority, application Japan, Feb. 5, 1980, 55-12593

Int. Cl.³ B65B *1/34*

U.S. Cl. 53—502 **17 Claims**

1. An apparatus for filling bags with a fluid product to a prescribed weight in a contamination-free manner, each bag having a spout with a removable cap, the apparatus comprising:

(a) means defining a germfree chamber;

(b) means for sterilizing the germfree chamber;

(c) a weighing platform under the germfree chamber for weighing the fluid product charged into a bag placed thereon;

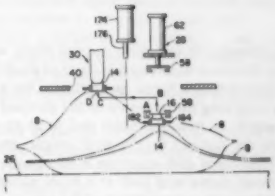
(d) a filling valve assembly fixedly mounted in the germfree chamber and having a filling head for charging the fluid product into the bag on the weighing platform, said filling valve assembly having first means for supplying therethrough at a first flowrate the fluid product of a weight less than a prescribed weight to be charged into the bag, and second means for supplying therethrough the fluid product at a second flowrate smaller than said first flowrate, said second means operating upon completion of the operation of said first means;

(e) means for sterilizing the interior of the filling head;

(f) a cap remover assembly mounted in a fixed position in the germfree chamber in side-by-side relation with the filling valve assembly;

(g) a spout carrier movably supported on the weighing platform for engagement with the spout of the bag;

(h) means mounted on said weighing platform for horizontally moving the spout carrier between a first position, where the cap is removed from and replaced on the spout of the bag by the cap remover assembly, and a second position where the spout is located substantially within the



germfree chamber and from where the spout of the bag is upwardly movable into engagement with the filling head of the filling valve assembly for receiving the fluid product therefrom;

(i) means mounted on said weighing platform for moving the spout carrier vertically between the first position and a position therebelow and between the second position and a position thereabove in which the spout of the bag is engaged with the filling head, said means for moving the spout carrier vertically having means to cause the spout carrier to move downwardly to the second position causing the engaged spout and filling head to become disengaged upon completion of the operation of the first means of the filling valve assembly, whereupon the bag freely rests on said weighing platform allowing accurate weighing of the fluid product being charged into the bag; and

(j) means for introducing sterilized air under pressure into the germfree chamber during the filling operation to maintain the chamber at a pressure higher than the atmospheric pressure.

4,446,675

ARTICLE-INSERTING STATION FOR PACKING MACHINE

Claus J. Mewes, Adlikon b.Regensdorf, Switzerland, assignor to Prometag AG, Regensdorf, Switzerland

Filed Jun. 15, 1981, Ser. No. 273,443

Claims priority, application Switzerland, Jun. 19, 1980, 4716/80

Int. Cl.³ B65B *35/44, 35/50*

U.S. Cl. 53—535 **3 Claims**

1. In a packaging machine in which a layer of articles is transferred to a container, the improvement which comprises in combination:

conveyor means defining a transport path for the movement of succession of articles in a given direction along said path;

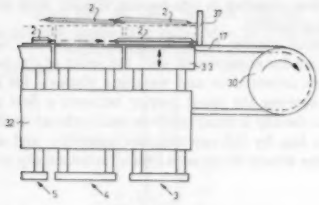
means along said path forming a stop for a first such article adapted to form a given layer;

a plurality of lifting elements spaced along said path from said stop in a direction opposite said given direction and

normally disposed below said path, each of said lifting elements having a dimension in said given direction which is less than a dimension in said given direction of said articles;

respective actuators connected with said lifting elements for raising same above said path upon energization of said actuators; and

control means for sequentially energizing said actuators to lift a first actuator proximal to said stop upon the engagement thereby of an article carried along said path in said given direction whereby a surface of the lifting element of said first actuator forms an abutment for a following article, energizing the actuator of the element of said following article to raise the same and form an abutment from the raised element for the next article, and repeating the energization of said actuators in succession until said layer is formed above said path at a level assumed by said elements upon the energization of the actuators of the articles forming said layer.



4,446,676

BAG HANDLING APPARATUS FOR A BAG MAKING MACHINE

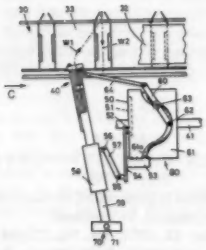
Bruno Gründler, Neuhausen am Rheinfall, Switzerland, assignor to SIG-Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Nov. 10, 1981, Ser. No. 320,061

Claims priority, application Switzerland, Nov. 11, 1980, 8373/80

Int. Cl.³ B31B *33/02*

U.S. Cl. 53—552 **10 Claims**



1. In a bag making machine including a generally vertically oriented forming element on which bags are formed in succession; a conveyor extending underneath said forming element and having a generally horizontal direction of advance, first drive means for intermittently advancing said conveyor, bag grasping tongs supported underneath said forming element below said conveyor, second drive means for moving said tongs upwardly through said conveyor to said forming element and for moving said tongs downwardly from said forming element through said conveyor, whereby said tongs draw a bag off said forming element and deposit the bag on said conveyor, the improvement comprising a third drive means for moving said tongs in a direction having a component parallel to said direction of advance of said conveyor and means for synchronizing said second and third drives with one another and with said first drive means for moving said tongs simultaneously upwardly and in said direction of advance during motion of said conveyor.

4,446,677

PACKING APPARATUS FOR A SQUEEZED PACKAGE

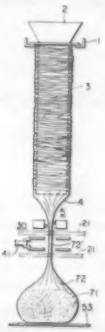
Toshiyuki Kokido, 1087-1, Oaza Mikekado, City of Buzen, Fukuoka Prefecture, Japan

Filed Oct. 19, 1981, Ser. No. 312,840

Claims priority, application Japan, Jan. 28, 1981, 56-12172

Int. Cl.³ B65B *93/42, 51/06*

U.S. Cl. 53—577 **2 Claims**



1. A packing apparatus, in particular for provisions in a squeezed style package, comprising: an appartus frame; a hopper means arranged at the top of said apparatus frame to supply said provisions by gravity into a synthetic resin film tube with a sealed bottom; a heat-seal and cutting means for said tube arranged beneath said hopper means and comprising a stationary member secured to said frame with a heat-sealer and a reciprocating member arranged horizontally opposite thereto with a cutting device; a squeezing means arranged beneath said heat-seal and cutting means comprising two pairs of horizontal parallel bar means disposed at right angles to each other; means for moving said bar means towards and away from each other in a synchronized fashion, whereby said tube is allowed to be lowered through a space formed by said stationary and reciprocating members of said heat-seal and cutting means as well as a pair of said parallel bar means of said squeezing device when they are all moved apart; a taping means mounted near said squeezing means including means to wind an adhesive tape around the squeezed portion of said synthetic resin film; a driving means to activate said heat-seal and cutting means, and said taping means; said driving means comprising a main driving shaft, a plurality of cam means secured thereto, a number of link means each operatively connected to said heat-seal and cutting means, and one of said pairs of parallel bar means, each activated by one of said cam means; said taping means being connected to and activated by said one of said pairs of parallel bar means; a drive transmitting means connected between said one pair of parallel bar means and the other pair of said parallel bar means whereby the other of said pairs of parallel bar means is activated, via said transmitting means, by said one of said pairs of parallel bar means; said transmitting means comprising a pair of pulley means secured to said apparatus frame and wire means reeved on each of said pully means, each of said wire means having two ends, one of the ends of both wire means connected to one parallel bar means of said one of said pairs of parallel bar means, the other ends of each of both wires being independently connected to an associated one of the parallel bar means of said other of said

pairs of parallel bar means, said wire means being shiftably mounted to said apparatus frame at right angles to said one of said pairs of parallel bar means.

4,446,678

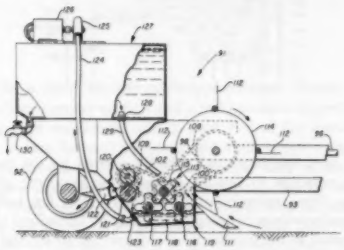
MATERIAL PROCESSING MACHINERY

Teddy V. Smith, 1421 Earlshire, Plano, Tex. 75075

Continuation of Ser. No. 190,481, Sep. 24, 1980, abandoned. This application Aug. 16, 1982, Ser. No. 408,516

Int. Cl.³ A01D *82/00, 43/10*

U.S. Cl. 56—1 **5 Claims**



1. A method of processing plant material comprising: harvesting at least the top one-third of growing plants; inputting the harvested plant material to a first processor comprising a plurality of roller members each with a plurality of lobes and grooves intermeshing with the lobes and grooves of at least one other roller member; said rollers being so positioned as to fracture the stalks and stems of said plant material along the greater part of their length while leaving the leaf cells of said plant material substantially unfractured; substantially dehydrating said plant material; thereafter inputting said so processed plant material to a second processor of the same general type as said first processor but with said rollers being so positioned as to produce maximum cell fracturing action; and subsequently more fully dehydrating the processed plant material output from said second processor.

4,446,679

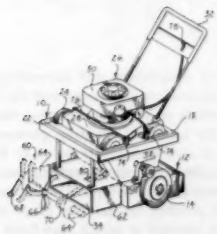
LAWNMOWER POWERED IMPLEMENT

Perry W. Thomas, 12708 12th St., Grandview, Mo. 64030

Filed Aug. 2, 1982, Ser. No. 404,560

Int. Cl.³ A01D *53/08*

U.S. Cl. 56—2 **4 Claims**



1. An implement to be powered by a lawnmower having a support, wheels for maintaining the support in vertically spaced relationship above a supporting surface, a handle projecting upwardly from the support, and a power source having an output shaft extending vertically downwardly through the support, said implement including:

a rigid frame having a plurality of wheels secured to the frame for transport of the latter;

a projection integral with the frame and projecting forwardly therefrom;

a platform mounted on the frame and extending generally horizontally in vertically spaced apart relationship above the frame;

said platform having a plurality of recesses therein, there being a recess for each lawnmower wheel respectively said recesses beng adapted to receive the lawnmower wheels to dispose the lawnmower in a substantially fixed, predetermined position on the platform with the lawnmower handle projecting upwardly and outwardly from the implement;

power take-off means carried by the frame and including a laterally extending rotatable shaft mounted generally horizontally on the frame beneath the platform, a rotatable shaft mounted generally vertically on the frame and projecting upwardly through the platform, and gear means interconnecting said vertical and horizontal shafts for rotation together about their respective axes;

sheave means secured to said horizontal shaft;

socket structure configured to telescope over said frame projection and extending in cantilevered relationship forwardly of the inmplement;

means releasably securing said socket structure on the projection;

a work member mounted on said socket structure for rotation on a horizontal axis, said member including a plurality of work performing elements extending radially outwardly from said axis;

belt means interconnecting said rotatable work means with said sheave means;

coupling means secured to said vertical shaft and adapted to be releasably coupled with the power output shaft of the lawnmower for transmitting the power from said source through the power take-off means to said work member; and

hold down means on the platform for releasably securing a lawnmower in said fixed position.

4,446,680

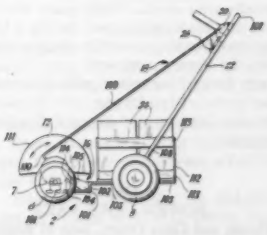
BATTERY POWERED LAWN EDGER

Thomas C. D'Alessandro, 7410 W. Lake Dr., West Palm Beach, Fla. 33404

Filed Apr. 26, 1982, Ser. No. 371,558

Int. Cl.³ A01D *69/02, 53/14*

U.S. Cl. 56—11.9 **1 Claim**



1. A lawn edger comprising:

a frame, said frame comprising a unitary plate, said unitary plate having a first flat plate portion and a third flat plate portion disposed in different horizontal planes, said first flat plate portion being nearer to the ground than said third flat plate portion, and a second flat plate portion disposed in a vertical plane, said second flat plate portion connecting said first and said third flat plate portions into said unitary plate,

a motor including an output drive shaft horizontally mounted on said frame, said motor being d.c. wound,

ground engaging means for transporting said frame, said ground engaging means being mounted on said frame, said ground engaging means comprising at least three wheels, the axis of rotation of a first of said wheels and said drive shaft being substantially parallel and in substantially the same vertical plane, the other two of said wheels being rearward of said first of said wheels and mounted for rotation on a horizontally disposed axle, said axle being ridigly mounted on said third flat plate portion of said frame,

means pivotally mounted on said motor to said frame for movement about a horizontal axis, said means pivotally mounted comprising first and second elongated mounting members, each said first and second elongated mounting member having first and second planar members, each said first planar member being rigidly attached to said motor, each said second planar member being rigidly attached to said second flat plate portion of said frame, each said first and second planar member of each said first and second elongated member being pivotally connected to one another, whereby to pivotally mount said motor to said frame,

a rigid lawn-edging blade mounted at one end of said shaft for rotation about a horizontal axis for effecting vertical cutting engagement with an overgrown lawn,

a handle connected to said frame mounted for engagement by an operator, said handle being one or more poles attached to said frame having a free-standing end for gripping by an operator of said lawn edger, and an end attached to said frame,

means mounted on said handle for effecting pivotal movement of said motor for raising and lowering said blade with respect to the ground, said means for effecting pivotal movement comprises a hand crank and a rigid link having an elongated portion extending from said free-standing end of said handle substantially to said motor, said rigid link having a right angle bend portion extending from said elongated portion of said rigid link to said motor, and being rigidly attached to said motor for rotational cranking said motor in a vertical plane responsive to the movement of said crank,

a source of electrical energy mounted on and supported by said frame, said source of electrical energy being one or more d.c. storage batteries mounted on said third flat plate portion of said frame, said one or more batteries electrically connected to said motor to run said motor and rotate said blade,

switch means electrically connecting said source of electrical energy to said motor in electrical series for turning said motor off and on,

a substantially semi-circular blade guard vertically mounted adjacent said blade, said guard having a horizontally extending rim extending about the circular periphery of said semi-circular blade guard, and

a receptacle for said batteries rigidly mounted to said third flat plate portion of said frame, said receptacle comprising at least two horizontally disposed ferrules surrounding said batteries.

4,446,681

POWER LAWN RAKE

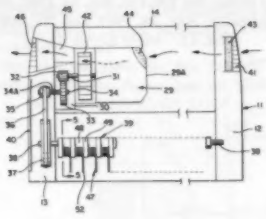
Ernest R. Dynie, and Colin Overy, both of Brockville, Canada, assignors to Black & Decker Inc., Newark, Del.

Filed Aug. 16, 1982, Ser. No. 408,483

Int. Cl.³ A01P *7/02;* **F01P** *1/00*

U.S. Cl. 56—16.7 **3 Claims**

1. In a power lawn rake, the combination of a pair of spaced-apart parallel side housings, a rotor journaled respectively in the housings and having a plurality of ground-engaging tines, a deflector box mounted between the side housings and having a curved forward wall disposed rearwardly of the rotor, a motor within the deflector box and being cantilever mounted on one of the housings transverse to said one of the housings, means for driving the rotor from the motor, said means including gearing means within a gear case disposed between the motor and the one side housing, the other side housing having air inlet openings formed therein, a filter carried by the other side housing adjacent to the air inlet openings therein, a fan driven by the motor, the motor having a housing with ventilation slots formed therein opposite said air inlet openings, the one side housing having air exhaust openings formed therein opposite



said air inlet openings, and a baffle carried by the one side housing adjacent to the air exhaust openings, the air inlet openings, filter, motor housing ventilation slots, fan, baffle and air exhaust openings defining a substantially horizontal air flow path relative to the ground whereby cooling air for the motor enters the air inlet openings, passes through the ventilation slots in the motor housing and around the baffle, and exits through the air exhaust openings in the one side housing.

4,446,682

AGRICULTURAL ATTACHMENT FOR HARVESTING AGRICULTURAL PRODUCTS ARRANGED IN ROWS

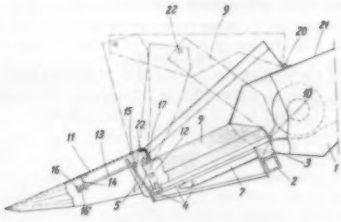
Wolfgang Jennen, and Gerd Sprügel, both of Harsewinkel, Fed. Rep. of Germany, assignors to Claas OHG, Harsewinkel, Fed. Rep. of Germany

Filed Dec. 7, 1981, Ser. No. 328,095

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1980, 3048327

Int. Cl.³ A01D *45/02*

U.S. Cl. 56—119 **7 Claims**



4. An agricultural attachment for harvesting agricultural products arranged in rows, such as corn and the like, comprising a frame; a plurality of product drawing elements; and a plurality of hingedly mounted dividing elements associated with said product drawing elements so as to form together with the latter a plurality of product drawing passages, each of said dividing elements having two parts which are articulately connected with one another so that they pivot relative to one another to assume a position in which they have a tipped roof shape and are fixable in said position, said parts of each of said dividing elements including a front part and a rear part as coinsidered in a travelling direction, said two parts of each of said dividing elements having proximal ends which in said position together form a tip of said tipped roof shape and distal ends which in said position form lower ends of said tipped roof shaft; and means for fixing the distal end of at least one of said parts so as to retain said at least one part in said position.

4,446,683

KNIFE DRIVE

William Rempel, and Bouko J. Kor, both of Winnipeg, Canada, assignors to Canadian CoOperative Implements Limited, Winnipeg, Canada

Filed Sep. 29, 1982, Ser. No. 426,965
Int. Cl.³ A01D *55/02*
U.S. Cl. 56—296 **28 Claims**

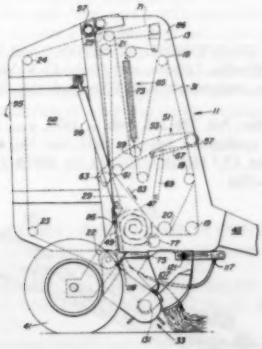
1. In a three section table-type swather header assembly including a center section and a wing section hingedly secured for limited movement one to each end of the center section; knife means for said sections, said knife means comprising in combination a pair of knife assemblies, each of said knife assemblies including a rigid guard bar secured to the front of each wing section, guards and hold-downs secured to said guard bar along the length thereof, a flexible guard bar section secured by one end thereof to the inner end of said rigid guard bar, means to mount the other end of said flexible guard bar section substantially centrally along the front of said center section, guards and hold-downs secured to said f. xible guard bar sections, a flexible knife for each knife assembly each mounted for reciprocation through each said knife assembly and extending along said rigid guard bar and said flexible guard bar to adjacent said other end thereof and drive means operatively connected to each of said knives to reciprocate same between said guards and hold-downs on said wing section and said center section, each of said knives spanning the hinged securement of the respective wing section with the center section.

4,446,684

CYLINDRICAL BALER WITH FLARE SHEETS ON CROP PICKUP

Roger W. Frimml, and Gerald F. Meiers, both of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Filed May 28, 1982, Ser. No. 382,887
Int. Cl.³ A01D *89/00*
U.S. Cl. 56—341 **7 Claims**



1. In a baler comprising:

a frame including a pair of spaced sidewalls;

a means for defining a bale-forming chamber for forming cylindrical bales, said chamber having a downwardly facing opening;

a pickup pivotably mounted to said frame for movement through a range of vertical positions, transversely extending between said sidewalls and extending below said opening; and

first and second flare sheets mounted on respective ends of said pickup;

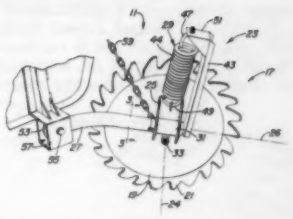
the improvement comprising means (1) mounting said pickup to said frame adjacent to the rear of said opening, (2) mounting each flare sheet to said frame adjacent to the front of said opening, and (3) pivotably mounting said flare sheets and pickup together between said front and rear of said opening for conjoint movement through said range of positions.

4,446,685

RAKE WHEEL ATTACHMENT

Jean-Pierre Coeffic, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed May 28, 1982, Ser. No. 382,883
Int. Cl.³ A01D *43/02*
U.S. Cl. 56—377 **14 Claims**



1. In a raking apparatus for a harvesting machine, said apparatus comprising:

a wheel for engaging and moving crop material along the ground;

an arm connected between said machine and said wheel, said arm having a longitudinal axis; and

means mounting said wheel on said arm for rotation, the improvement comprising:

said mounting means mounting said wheel for pivoting about said longitudinal axis responsive to impact of the wheel with a foreign object.

4,446,686

METHODS OF AND APPARATUS FOR CONTROLLING CORE-TO-SHEATH LENGTH RATIO IN LIGHTGUIDE FIBER CABLE AND CABLE PRODUCED BY THE METHODS

Andrew J. Panuska, Lilburn; Manuel R. Santana, Doraville, and Robert B. Sprow, Dunwoody, all of Ga., assignors to AT&T Technologies, Inc., New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 2, 1982, Ser. No. 414,229
Int. Cl.³ G02B *5/16, 5/14;* H01B *13/14*
U.S. Cl. 57—6 **23 Claims**

1. A method of controlling the length of a lightguide fiber core relative to the length of an enclosing composite sheath of a cable in which relative movement between the core and sheath can occur and in which the sheath includes reinforcing members having a relatively high modulus of elasticity and a plastic jacket, said method comprising the steps of:

advancing the cable along a path of travel;

elongating the sheath relative to the core along a portion of the path by applying tensile forces to the sheath; and

coupling the core to the elongated sheath to prevent relative movement therebetween by moving the cable in a prede-

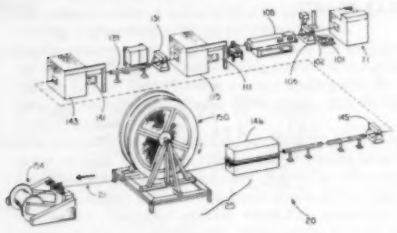
termined number of circular convolutions each of which has a diameter that exceeds the diameter of any subsequent convolution in which the coupled cable is wound, said elongating and coupling steps cooperating to allow sufficient additional length of the core to be advanced relative to the sheath to cause the ratio of the lengths of the core and the sheath to be a predetermined value when the tensile forces are reduced and the composite sheath allowed to return elastically to its original length.

11. An apparatus for controlling the length of a lightguide fiber core of a cable relative to the length of a composite sheath system, said apparatus comprising:

means for supplying a core of lightguide fibers;

means disposed along a path of travel of the fibers for enclosing the core in a sheath system, which includes at least one plastic jacket and strength members having a relatively high modulus of elasticity and extending coextensively with the core, such that relative movement may occur between the core and the sheath system;

means including a reel for taking up the cable;



first moving means interposed between said enclosing means and said means for taking up the cable for advancing the cable at a substantially constant velocity along a portion of the path of travel; and

second moving means disposed between said first moving means and the takeup reel and cooperating with said first moving means for elongating the sheath relative to the core along the portion of the path of travel by applying tensile forces to the sheath and for coupling the core to the elongated sheath to prevent relative movement therebetween by causing the cable to be moved in a predetermined number of convolutions each of which has a diameter that exceeds the diameter of any convolution in which the coupled cable is subsequently wound, the elongating and coupling of the sheath being effective to allow sufficient additional length of the core to be advanced relative to the sheath to cause the ratio of the length of the core and that of the sheath to have a predetermined value when the tensile forces are reduced and the composite sheath allowed to return elastically to its original length.

4,446,687

PNEUMATIC YARN SPLICING APPARATUS FOR SPLICING CORE SPUN YARNS

Hiroshi Mima, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

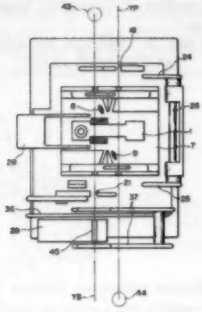
Filed Dec. 2, 1982, Ser. No. 446,486

Claims priority, application Japan, Dec. 2, 1981, 56-194790

Int. Cl.[3] **D01H** *15/00*

U.S. Cl. 57—22 **4 Claims**

1. A pneumatic yarn splicing device of the yarn end untwisting type including two nozzle pipes for untwisting and sucking yarn ends, and a yarn splicing hole disposed midway between the nozzle pipes for splicing the untwisted yarn ends with a stream of air, characterized in that said nozzle pipes have opening areas reduced with respect to the diameter of the



nozzle pipe for increasing the sucking and attractive force by the nozzle pipes.

4,446,688

DOUBLE TWISTING MACHINE

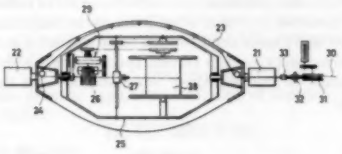
Iwao Ueda, Osaka, Japan, assignor to Hamana Iron Work Co., Ltd., Osaka, Japan

Filed Mar. 29, 1982, Ser. No. 362,943

Claims priority, application Japan, Mar. 31, 1981, 56-45755

Int. Cl.[3] **D01H** *7/86*

U.S. Cl. 57—58.65 **5 Claims**



1. A double twisting machine for winding a wire around a take-up roll, comprising:

a flyer having opposite ends; and

a plurality of motors, said plurality of motors separately and directly driving each of said ends of said flyer so as to wind said wire around said take-up roll.

4,446,689

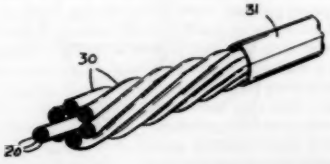
TELECOMMUNICATION CABLES

Tommy G. Hardin, Lilburn, and Bruce C. Vrieland, Norcross, both of Ga., assignors to AT&T Technologies, Inc., New York, N.Y.

Division of Ser. No. 230,233, Feb. 2, 1981, Pat. No. 4,423,589. This application Jan. 31, 1983, Ser. No. 462,639

Int. Cl.[3] **H01B** *11/02, 13/04;* **D07B** *3/00*

U.S. Cl. 57—204 **2 Claims**



1. A telecommunications cable having improved insertion loss characteristics made in accordance with the method com-

prising the steps of forming a plurality of wire units by advancing groups of twisted wire pairs or quads through twisting stations wherein each group is alternately twisted in clockwise and counterclockwise rotary directions with both the frequency and amplitude of the twisting being modulated; stranding the plurality of units so formed together into a cable core; and forming a conductive sheath around the core.

4,446,690

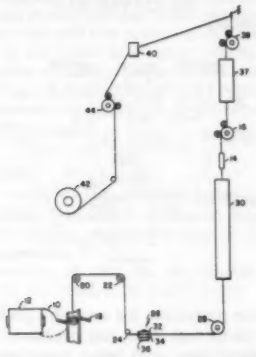
BAR BALLOON CONTROL

Charles E. Warner, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 18, 1982, Ser. No. 434,898

Int. Cl.³ D01H 7/18; D02G 3/34; D02H 13/22; B65H 59/22

U.S. Cl. 57—284 **3 Claims**



1. Apparatus to produce a false twisted multifilament yarn comprising: yarn creel means, a false twist device, a heater means located between said yarn creel means and said false twist device, a disc type tension means located between said heater means and said yarn creel means to intermittently and randomly vary the flow of yarn from said creel means to said false twist device, a first means to supply yarn from said yarn creel means to said false twist device, a second means operatively associated with said yarn creel means to prevent the yarn from said yarn creel means being supplied to said false twist device from forming a full balloon path as the yarn is supplied from the yarn creel, said creel means including a creel pin adapted to support a yarn package and a yarn guide member, said second means including a bar member mounted on said creel means between said creel pin and said yarn guide member and a third means to supply false twisted yarn from said false twist device to a take-up means to take-up the false twisted yarn.

4,446,691

HIGH A.C.-D.C. YARN TENSION CONTROL

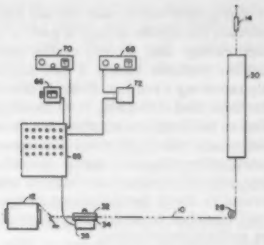
Charles E. Warner, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Nov. 10, 1982, Ser. No. 440,497

Int. Cl.³ D01H 7/18; D02G 3/34; D02H 13/22; B65H 59/22

U.S. Cl. 57—284 **11 Claims**

1. An electromagnetically actuated tension device comprising: an electromagnet, a post member operably associated with said electromagnet, a first metallic disc member mounted on said post, a second metallic disc member mounted on said post adjacent said first disc member, a D.C. circuit supplying direct current to said electromagnet and means supplying alternating current for short periods of time to said electromagnet to periodically allow said first and second disc members to move



suddenly relative to one another and relative to the electromagnet.

4,446,692

FLUIDIC CONTROL OF AIRFLOW IN COMBUSTION CHAMBERS

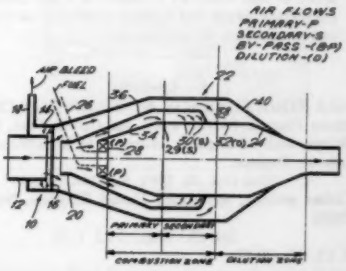
Richard C. Adkins, Milton Keynes, England, assignor to Rolls-Royce Limited, London, England

Continuation-in-part of Ser. No. 827,109, Aug. 23, 1977. This application Jul. 31, 1979, Ser. No. 62,418

Claims priority, application United Kingdom, Sep. 9, 1976, 37326/76

Int. Cl.³ F02C 7/057

U.S. Cl. 60—39.23 **4 Claims**



1. A gas turbine engine combustion apparatus having fluidic means for varying the air flow to the combustion apparatus to control the air:fuel ratio over an operating range of the gas turbine engine, said apparatus comprising;

a variable rate vortex controlled diffuser including a primary duct for receiving a supply of air and having an exit end for discharging the same, a secondary duct surrounding the exit end of said primary duct, a fence in said secondary duct positioned downstream of the exit end of said primary duct for generating a vortex to diffuse a portion of the air discharged from said primary duct, a bleed duct communicating with said secondary duct upstream of said fence and of said exit end of said primary duct for controlling the vortex, and a capture tube positioned within said secondary duct and spaced downstream of said fence for receiving a portion of the air directly from said primary duct;

a combustion chamber defined by a casing and having an outlet at its downstream end, a first air inlet means at its upstream end for receiving as primary air a portion of the air from said capture tube, a second air inlet means positioned downstream from said first air inlet means for receiving secondary air, and a third air inlet means positioned downstream from said second air inlet means for

receiving dilution air, said first air inlet means including an opening at the upstream end of said combustion chamber for receiving directly air discharged from said capture tube;

a second casing attached to said capture tube and extending downstream therefrom around a part of said combustion chamber casing, said second casing defining with said combustion chamber casing a first annular housing for directly receiving a portion of the air discharged from said capture tube, and delivering it as secondary air unmixed with fuel to said combustion chamber through said second air inlet means which comprise downstream openings in said combustion chamber casing providing communication between said combustion chamber and said first annular housing to direct the secondary air transversely of and into said chamber to insure proper mixing and promote further uniform combustion;

a third casing attached to said secondary duct of said variable rate vortex controlled diffuser, said third casing extending from said secondary duct downstream around said second casing and a portion of said combustion chamber casing and attached thereto, said third casing defining with said second casing and said combustion chamber casing a second annular housing for receiving diffused air and delivering it into said combustion chamber, said third air inlet means including openings in said combustion chamber casing providing communication between said combustion chamber and one of said first and second annular housings to direct the dilution air transversely of and into said combustion chamber for penetrating and cooling the hot combustion gases therein and for creating a substantially uniform temperature profile for such gases at said combustion chamber outlet; and

a unified fuel injection apparatus having a circumferential array of fuel injectors in which at each circumferential position, a single fuel injector is located at the upstream end of said first air inlet means.

4,446,693

WALL STRUCTURE FOR A COMBUSTION CHAMBER

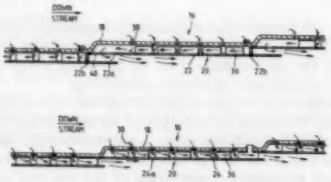
Anthony Pidcock, Shelton Lock, and George Pask, Stanton-by-Bridge, both of England, assignors to Rolls-Royce Limited, London, England

Filed Oct. 20, 1981, Ser. No. 312,985

Claims priority, application United Kingdom, Nov. 8, 1980, 8035956

Int. Cl.³ F02C *7/12, 7/20*

U.S. Cl. 60—39.32 **11 Claims**



1. A wall structure for gas turbine engine combustion equipment, the wall structure comprising: at least an outer wall and an inner wall spaced therefrom, said outer wall being perforate to allow a flow of cooling air to enter the space between the outer and inner walls, the wall structure having outlets to allow cooling air to flow from the space between the outer and inner walls to the interior of the combustion equipment, said inner wall comprising a plurality of circumferentially and axially arranged wall elements, each inner wall element having an upstream end and a downstream end, means for positively attaching the downstream end of each inner wall element to the outer wall, each upstream end of each inner wall element being located between the downstream end of an axially adjacent inner wall element and the outer wall, said means of positive attachment of each inner wall element including a non-movable attachment point positioned circumferentially in the center of the downstream end of said inner wall element and two further attachment points positioned circumferentially on each side of said centrally positioned attachment point for permitting relative movement of said wall element in an axial and a circumferential direction, and a plurality of raised lands extending from each inner wall element toward and terminating short of said outer wall, said lands defining a plurality of internal flow passages for the cooling air.

4,446,694

ELECTRIC REGENERATION SYSTEM FOR GAS TURBINE

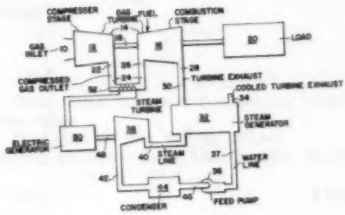
Thomas A. Walton, 15327 Gran Vista Dr., Houston, Tex. 77083

Filed Feb. 19, 1982, Ser. No. 350,220

Claims priority, application Canada, Feb. 20, 1981, 371446

Int. Cl.³ F02C *6/18*

U.S. Cl. 60—39.182 **5 Claims**



1. An electric regenerator for use with a gas turbine having at least one compressor stage, one combustion stage and at least one turbine stage, each being interconnected by duct means which contain and direct compressed gas, said regenerator comprising an electric heating means located within said duct means, said heating means being supplied with electrical power generated from exhaust gas exiting from said gas turbine, wherein the temperature of said heating means is greater than the temperature of said compressed gas flowing in said duct means at the location of said electric heating means.

4,446,695

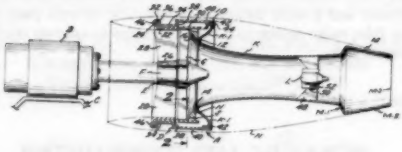
AIRCRAFT PROPULSION ASSEMBLY

Wilson A. Burtis, 5011 Havard Ave., Westminster, Calif. 92683

Continuation-in-part of Ser. No. 81,579, Oct. 3, 1979, abandoned. This application Nov. 6, 1981, Ser. No. 318,759

Int. Cl.³ F02K *5/00*

U.S. Cl. 60—200.1 **6 Claims**



1. An aircraft propulsion assembly that includes:

a. a tubular nozzle that has a rear end and a forward end portion that extends outwardly and rearwardly;

b. a generally cylindrical housing assembly that has a forward and rearward end, said forward end portion of said nozzle secured to said rearward end of said housing and cooperating therewith to define a plenum chamber; a ring shaped stator supported in said housing and cooperating with said forward end portion of said nozzle to define a circumferentially extending orifice, said stator having a

plurality of circumferentially spaced slots therein that are in communication with said plenum chamber; a bearing disposed in a fixed position in said housing; and a power driven shaft rotatably supported in said bearing; and

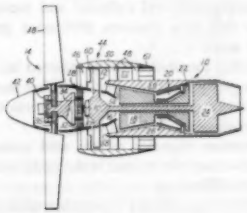
c. a rotatable air stream generating element disposed in said housing forwardly of said stator and driven by said shaft, said air stream generating element when rotated generating a first portion of a rearwardly moving air stream that discharges directly into said nozzle to flow rearwardly therethrough to impart forward thrust to said propulsion assembly, and a second portion of a rearwardly moving air stream that flows through said slots into said plenum chamber to be compressed and discharge through said circular orifice at a pressure greater than that of said first portion, said second portion of air flowing from said orifice flowing rearwardly in said nozzle adjacent the interior surface thereof at a velocity greater than said first portion and substantially insulating said first portion from frictional drag and intermingling with said first portion as said first and second portions move rearwardly through said nozzle, with said first portion exiting from said rearward end of said nozzle at a higher velocity than if said second portion were not present, and increasing the thrust generated by said first portion without increasing appreciably the power required to rotate said air stream generating element.

4,446,696

COMPOUND PROPULSOR

Donald F. Sargisson, Cincinnati, and Daniel L. Harshman, Forest Park, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jun. 29, 1981, Ser. No. 278,924
Int. Cl.³ F02K *3/06, 3/072, 3/075*
U.S. Cl. 60—226.3 **20 Claims**



1. A compound propulsor comprising:

a. a core gas turbine engine for producing power;

b. a fan section including a fan encased within a cowl;

c. at least one propeller comprising a plurality of blades and including means for varying the pitch of said blades; and

d. a single rotatable shaft connecting a turbine of said core engine with said fan and a gear train coupling said single rotatable shaft to each said propeller, whereby said single rotatable shaft distributes a portion of said power to said fan and another portion of said power to each said propeller.

4,446,697

HYDRAULIC FAN DRIVE SYSTEM INCLUDING VARIABLE DISPLACEMENT PUMP

Edward J. Goscenski, Jr., Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 907,064, May 18, 1978, Pat. No. 4,179,888. This application Dec. 4, 1979, Ser. No. 100,077
Int. Cl.³ F01P *7/16*
U.S. Cl. 60—443 **8 Claims**

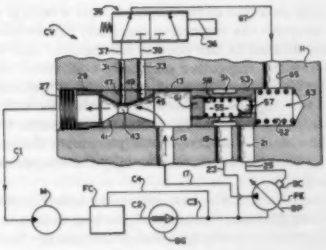
1. A vehicle engine cooling and steering gear drive system comprising:

(a) an engine driven variable displacement pump including a pumping element operable to deliver fluid at a rate generally proportional to engine speed for any given displacement, said pump having fluid inlet and outlet ports and including fluid pressure actuated means to vary the displacement of said pump, said pump comprising the sole source of pressurized fluid for said system and having a fluid delivery rate of at least Z at engine idle and maximum pump displacement;

(b) a hydraulic fan motor having fluid inlet and outlet ports, said fluid inlet port being in series fluid communication with said pump outlet port, said fan motor having a fan speed at engine idle corresponding to a fluid flow rate of approximately Y, and a fan peak speed corresponding to a fluid flow rate of approximately X;

(c) bypass valve means connected in parallel with said fan motor, operable to bypass said fan motor and being responsive to the need for cooling, said bypass valve means being capable of bypassing at least a substantial portion of Y at a first relatively lower temperature and capable of substantially preventing bypass flow at a second relatively higher temperature;

(d) flow control valve means having its inlet in fluid communication with said outlet port of said fan motor and with said bypass flow, said flow control valve means having primary and secondary fluid outlets and being operable to



communicate a fluid flow rate of approximately Z from said fluid inlet to said primary outlet over substantially the entire range of operating engine speeds and to communicate substantially all fluid flow in excess of Z from said inlet to said secondary outlet, Z being substantially less than X;

(e) an open-center steering gear mechanism having inlet and outlet ports, said inlet port being in fluid communication with said primary outlet of said flow control valve means, said outlet port of said steering gear mechanism and said secondary outlet of said flow control valve means being in fluid communication with said fluid inlet port of said pump; and

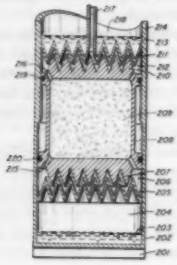
(f) control valve means in fluid communication with said fluid outlet port of said pump and being operable to communicate a control fluid pressure to said pressure actuated means of said pump, said control valve means including valve means responsive to demand for cooling and being operable (1) at said first relatively lower temperature to communicate a control fluid pressure to maintain the fluid delivery rate of said pump at Y and (2) at said second relatively higher temperature to communicate a control fluid pressure to maintain the fluid delivery rate of said pump at X, over substantially the entire range of operating engine speeds.

4,446,698

ISOTHERMALIZER SYSTEM

Glendon M. Benson, Danville, Calif., assignor to New Process Industries, Inc., Minneapolis, Minn.

Filed Mar. 18, 1981, Ser. No. 244,941
Int. Cl.³ F02G 1/04
U.S. Cl. 60—520 **29 Claims**



1. An isothermalizer system comprising:
- a chamber having a heat source end and a heat sink end and a heat source having a substantially constant temperature from cycle to cycle at said heat source end;
- a pair of thermally conductive walls comprising concentric tapered rings to increase their surface area spanning the chamber and forming a heat source subchamber at the heat source end of the chamber, a heat sink subchamber at the heat sink end of the chamber, and a central subchamber between the respective thermally conductive walls;
- a piston located in the central subchamber and reciprocal between the respective thermally conductive walls, said piston having complementary tapered ridges which mesh with the rings of the thermally conductive walls;
- a heat source fluid in the heat source subchamber to maintain the thermally conductive wall proximate the heat source end of the chamber at substantially the temperature of the heat source;
- a heat sink fluid in the heat sink subchamber having a temperature different from that of the heat source to maintain the thermally conductive wall proximate the heat sink end of the chamber at a substantially constant temperature different from that of the heat source;
- a working fluid located between the respective walls and the piston, the working fluid adjacent the wall proximate the heat source end of the chamber having a temperature substantially equal to that of the heat source and the working fluid adjacent the wall proximate the heat sink end of the chamber having a temperature substantially equal to the temperature of the heat sink fluid;

heat regenerative material; and

means for cycling the working fluid to and from the opposite sides of the piston within the chamber through the regenerative material, said working fluid undergoing a thermodynamic cycle which achieves nearly Carnot efficiency.

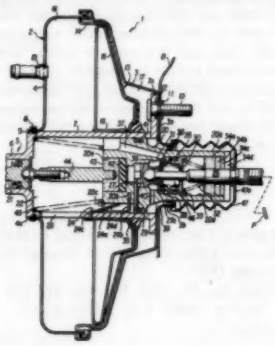
4,446,699

BRAKE BOOSTER FOR VEHICLES

Takashi Fujii, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Feb. 3, 1981, Ser. No. 231,156
Claims priority, application Japan, Feb. 8, 1980, 55-15190
Int. Cl.³ F15B 9/10; B60T 13/00
U.S. Cl. 60—547.1 **7 Claims**

1. A brake booster for vehicles, having a vehicle body with a brake pedal, comprising:
- a tubular housing, forming a seat portion at an input side thereof and a short sleeve portion at an output side thereof, said seat portion having an inner wall,
- a brake master cylinder coaxially adjacent to an output side of said tubular housing, and having a piston and cylinder body,
- a cylinder integrally formed with said cylinder body of said brake master cylinder, said cylinder passing through said short sleeve portion and extending to said inner wall of said seat portion within said tubular housing for attaching said tubular housing to said vehicle body,
- a seal member positioned between said cylinder and said short sleeve portion;
- a flange member positioned adjacent said inner wall of said seat portion and formed on an end portion of an outer circumference portion of said cylinder wherein said master cylinder body, said cylinder and said flange member constitute a one-piece member,
- a first movable member axially dividing a space formed on an outer circumference portion of said cylinder by said



tubular housing and said cylinder and movable to said output side due to a pressure difference generated between both sides,
- a seocnd movable member slidably inserted into said cylinder and integrally movable with said first movable member and further comprising an end portion outwardly projected from said tubular housing,
- a valve mechanism disposed within said second movable member and actuatable by said brake pedal and regulating said pressure difference,
- an output member operatively connected with said first and second movable members and contacting said piston of said brake master cylinder, and
- means mounted on said flange for attaching said brake booster and said brake master cylinder to said vehicle body.

4,446,700

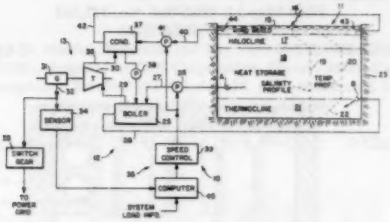
SOLAR POND POWER PLANT AND METHOD OF OPERATING THE SAME AS A PART OF AN ELECTRICAL GENERATING SYSTEM

Lucien Y. Bronicki, Rehovot; Haim Hershman, Givat Shmuel, both of Israel, and Gerard Lehmann, Paris, France, assignors to Solmat Systems, Ltd., Yavne, Israel

Filed Sep. 15, 1981, Ser. No. 302,575
Int. Cl.³ F03G 7/02
U.S. Cl. 60—641.8 **20 Claims**

1. A method for using a solar pond power plant of the type having a solar pond with a heat storage layer for storing heat absorbed from solar radiation incident on the pond, a lower-temperature, Rankine-cycle turbogenerator operating on heat extracted from the heat storage layer, the method being to provide a turbogenerator combination with a generating ca-

pacity of Q_f in excess of Q_e, where Q_e is the net electrical energy that can be generated when heat is extracted from the



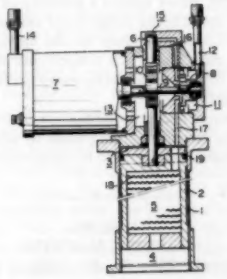
heat storage layer at substantially the same average rate at which heat is absorbed by this layer.

4,446,701

FLUID-OPERATED REFRIGERATING MACHINE

Mitsuru Suzuki, and Yasuo Tomita, both of Hiratsuka, Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Sep. 13, 1982, Ser. No. 417,351
Claims priority, application Japan, Sep. 14, 1981, 56-145295
Int. Cl.³ F25B *9/00*
U.S. Cl. 62—6 **2 Claims**



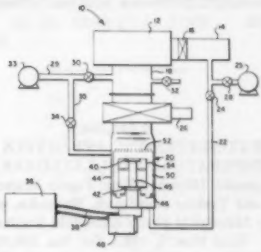
1. A fluid-operated refrigerating machine comprising:
a refrigeration cylinder;
a displacer adapted to reciprocate within said cylinder and defining in said cylinder a first chamber and at least one second chamber, the volumes of which are varied by the reciprocating motion of said displacer such that when the volume of said first chamber increases the volume of said second chamber decreases and vice versa;
a driving cylinder axially aligned with said refrigeration cylinder;
a piston solidly connected to said displacer and adapted to reciprocate within said driving cylinder to define a driving chamber variable in volume by the reciprocating motion of said piston;
a fluid path connecting said first and second chambers;
thermal storage means provided in said path;
a supply conduit for supplying high-pressure fluid;
an exhaust conduit for exhausting low-pressure fluid;
a rotary valve driven by a motor to control fluid communication such that at its first position said supply conduit is communicated with said path while said exhaust conduit is communicated with said driving chamber and at its second position said supply conduit is communicated with said driving chamber while said exhaust conduit is communicated with said path; and
a mechanical converter for restricting the stroke of said piston, said converter having a first member operatively connected to said piston for reciprocating with said piston, a second member rotating about an axis stationary with respect said driving cylinder and a third member interconnecting said first and second members for converting the reciprocating motion of said first member to the rotary moion of said second member.

4,446,702

MULTIPORT CRYOPUMP

John F. Peterson, Lynnfield, and Allen J. Bartlett, Milford, both of Mass., assignors to Helix Technology Corporation, Waltham, Mass.

Filed Feb. 14, 1983, Ser. No. 466,122
Int. Cl.³ B01D *8/00*
U.S. Cl. 62—55.5 **11 Claims**



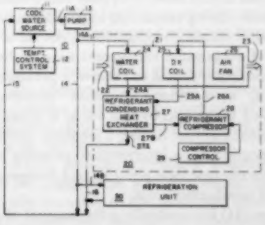
1. A cryopump system comprising:
a. a work chamber;
b. a load lock for receiving material to be introduced into the work chamber;
c. a cryopump housing in fluid communication with each of the work chamber and load lock;
d. a two stage refrigerator within the cryopump housing;
e. a second stage cryopumping surface in thermal contact with the second stage of the refrigerator; and
f. a radiation shield in thermal contact with the first stage of the refrigerator within the cryopump housing surrounding the second stage cryopumping surface, the shield having a frontal opening for providing gas communication from the working chamber to the second stage cryopumping surface and a rear opening for providing gas communication from the load lock to the second stage cryopumping surface.

4,446,703

AIR CONDITIONING SYSTEM AND METHOD

Thomas A. Gilbertson, 216 Sandringham, N., Moraga, Calif. 94566

Filed May 25, 1982, Ser. No. 381,862
Int. Cl.³ F25B *41/00*
U.S. Cl. 62—113 **11 Claims**



1. The method of conditioning air in a multi-unit building comprising disposing at least one air handling unit in each building unit with at least one water coil and one mechanical

refrigerant cooled second heat absorbing means arranged in series in said air handling unit, separately circulating air in heat exchange relation with said water coil and said second heat absorbing means in each said air handling unit, circulating cooling water through said water coil in each air handling unit to provide primary cooling of air circulating therethrough independent of the operating condition of said second heat absorbing means, circulating mechanically refrigerated cooling fluid through said second heat absorbing means in each air handling unit when demand for refrigeration of air passing therethrough exceeds the cooling capacity of said cooling water traversing said water coil therein, and utilizing at least a portion of the cooling water exiting said water coil in each air handling unit to at least partially condense vaporized refrigerant associated with producing said mechanically refrigerated cooling fluid.

4,446,704

AIR CONDITIONING APPARATUS WITH TEMPERATURE REGULATED COOLING

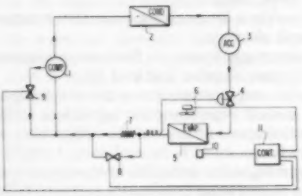
Kisuke Yamazaki; Hitoshi Iijima; Fumio Matsuoka, all of Kamakura, and Toshizo Nishizawa, Shizuoka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 8, 1982, Ser. No. 356,007

Claims priority, application Japan, Apr. 9, 1981, 56-53325

Int. Cl.³ F25B *41/00*

U.S. Cl. 62—180 **12 Claims**



1. An air conditioning apparatus comprising:

(a) a compressor **(1)** for compressing a refrigerant to produce a high-pressure, high-temperature gaseous refrigerant,

(b) a condesnor **(2)** for condensing said gaseous refrigerant to liquefy said refrigerant,

(c) an expansion valve **(4)** for expanding said liquid refrigerant,

(d) an evaporator **(5)** for evaporating said expanded liquid refrigerant,

(e) a fan **(6)** for forcing air to be heat-exchanged through said evaporator,

(f) pressure reduction means provided between said evaporator and compressor, a bypass valve adapted to be open and closed being connected in parallel across said pressure reduction means to selectively provide a bypass passage for said evaporated refrigerant so as to bypass said pressure reduction means to control a pressure reduction rate thereof, a maximum pressure reduction rate being achieved when said bypass valve is closed,

(g) a feedback circuit having a feedback valve **(9)** for returning a portion of an intermediate pressure level refrigerant from an intermediate point in said compressor to the inlet of said compressor, and

(h) means **(11)** for controlling the amount of said refrigerant compressed by said compressor, said control means controlling the amount of refrigerant compressed by the compressor by controlling the fan, the feedback valve, and the bypass valve.

4,446,705

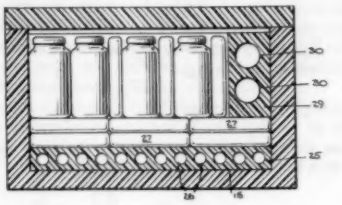
SHIPPING CONTAINER

Terry L. Loucks, Red Bank, N.J., assignor to Environmental Testing & Certif. Corp., Edison, N.J.

Filed May 12, 1982, Ser. No. 377,361

Int. Cl.³ F25D *3/08*

U.S. Cl. 62—372 **9 Claims**



1. A device of the class described comprising:

an outer container having four walls, a bottom and openable top defining an insulated storage space;

an insert of insulating material adapted to lie flat on the bottom of said storage space and to be removably positioned within the storage space in friction fit with at least two opposing of said walls and formed to accommodate and securely retain therein a plurality of vials;

said storage space being constructed and arranged to retain packaged coolant medium on the upper surface of said insert for maintaining the temperature of the content of said vials within a predetermined range for a given period of time; and

means permitting access to the portion of said insert adjacent at least one of said opposing walls to which said insert is fitted to enable said insert to be removed from said storage space.

4,446,706

WASHING MACHINE

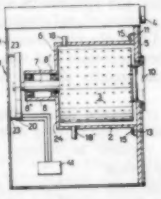
Carl S. M. Hartwig, Täby, Sweden, assignor to Institut Cerac S.A., Ecublins, Switzerland

Filed Dec. 15, 1982, Ser. No. 449,937

Claims priority, application Switzerland, Dec. 18, 1981, 8097/81; Jun. 29, 1982, 3971/82

Int. Cl.³ D06F *23/02, 37/38;* H02P *5/34*

U.S. Cl. 68—24 **8 Claims**



1. A washing machine comprising; a casing **(1)** which includes a washing-liquid container **(2)** and a washing drum **(3)** rotatably supported within the container **(2)** and intended to receive a washing load; a single electric bi-directional, brushless a.c. motor **(84)** including a rotor and a stator, means directly mechanically connecting said rotor to the rotatable washing drum, said a.c. motor being of multi-pole type and provided with terminals connected to a source of a.c. mains voltage via the out-put terminals of an inverter **(41)**, and said inverter comprising means for generating an a.c. voltage at a variable frequency having a maximum value corresponding to the highest rotational speed of the washing drum selected and

being in excess of the frequency of the mains voltage supplied to the inverter input.

4,446,707

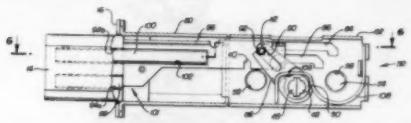
DEADBOLT

Richard O. Mullich, Burbank, and Ray Dushane, Fullerton, both of Calif., assignors to TRE Corporation, Beverly Hills, Calif.

Continuation of Ser. No. 190,354, Sep. 24, 1980, abandoned. This application Sep. 2, 1982, Ser. No. 414,293

Int. Cl.³ E05C *1/06*

U.S. Cl. 70—134 **3 Claims**



3. A deadbolt lock assembly which can be assembled with one of at least two different selectable lockbolt extensions, comprising:

a latchcase;

a rotatable hub mounted within the latchcase, said hub including an arm extending radially therefrom;

a lockbolt slidably carried within said latchcase, a pair of pin-receiving openings extending through said lockbolt at locations which are mutually laterally offset with respect to the direction of travel of said lockbolt;

said latchcase including a pair of elongated slots extending generally in said direction of travel and being laterally aligned with said openings;

pin means for coupling the arm of the hub to one of the locations on the lockbolt, said pin means being insertable through one of said slots and a corresponding one of said openings, so that when the hub is rotated, the bolt will be moved longitudinally within the latchcase between a fully extended and a fully retracted position, the extent of full lockbolt travel being determined by which opening and slot said pin means extends through, said extent of full lockbolt travel thus being adjustable after lock assembly.

4,446,708

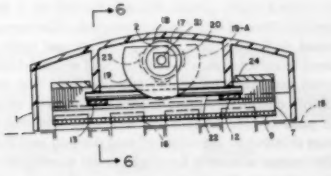
KEYBOARD LOCK

Laurice D. Ely, 660 W. 17th St., Costa Mesa, Calif. 92627

Filed Jan. 12, 1982, Ser. No. 338,987

Int. Cl.³ E05B *73/00*; B65D *55/14*

U.S. Cl. 70—166 **6 Claims**



1. An outer casing having a top and four sides, with one of said sides containing a splined cylindrical opening,

at least two movable legs supported by said casing and extending downwardly therein,

a locking barrel mounted rotatably to said casing and containing a key-slot accessible from one of said sides, said barrel cooperating with two of said splines to provide two locking positions,

said movable legs including a pair with end flanges facing each other, said flanges having serrated edges,

said pair of legs being held apart by a circular wedge attached to said barrel and extending therebetween when said barrel is in one of said locking positions, and forced toward each other by spring means when said barrel is in the other of said locking positions, and

a pair of longitudinal members adjacent to both said circular wedge and said legs.

4,446,709

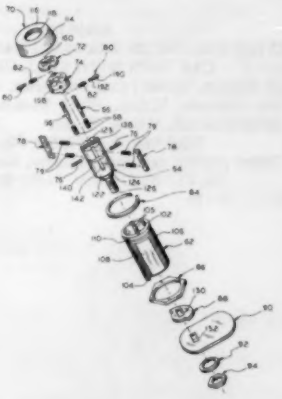
CYLINDER LOCK MECHANISM

Robert L. Steinbach, Glendale Heights, Ill., assignor to Chicago Lock Co., Chicago, Ill.

Filed Jul. 14, 1981, Ser. No. 283,226

Int. Cl.³ E05B *17/14, 27/08*

U.S. Cl. 70—363 **36 Claims**



1. A cylinder lock mechanism which comprises:

a tubular barrel,

a lock cylinder received in said barrel for rotation about the longitudinal axis of the cylinder and having tumbler bore-forming means extending longitudinally therein,

a plurality of tumblers received in said bore-forming means for reciprocal longitudinal movement therein,

a cap secured to a front end of the barrel and having an opening for insertion of a key therethrough,

a discrete facing member received in said barrel for rotation about said axis and interposed between said cap and said cylinder, said facing member having an opening arranged for registry with said cap opening and with said bore-forming means, and said facing member comprising hard material resistant to drilling,

a discrete spacer received in said barrel for rotation about said axis and interposed between said facing member and said cylinder, said spacer having an opening arranged for registry with said cap opening and with said bore-forming means,

said openings when in said registry receiving a key for insertion thereof into engagement with said tumblers,

an engagement member extending transversely of said cylinder for engagement with said tumblers and laterally movable to and from the tumblers,

an elongated locking member extending longitudinally of said cylinder for engagement with said engagement member and laterally movable to and from said tumblers,

means on said cylinder and said barrel respectively for engaging said locking member along its length for locking purposes,

means on each of said tumblers for engaging said engagement member to support said locking member in a project-

ing position with respect to said cylinder and in engagement with said locking member-engaging means on said barrel for locking purposes, and

means on each of said tumblers permitting said engagement member to move towards the tumblers, thereby to permit retraction of said locking member from said projecting position for unlocking purposes,

said engagement member and said locking member being free-floating in the lock mechanism such that said engagement and locking members are free to tilt in respective directions transverse to each other.

4,446,710

DEVICE FOR USE IN THE MANUFACTURE OF METAL CAN TOPS WITH PULL-UP RINGS

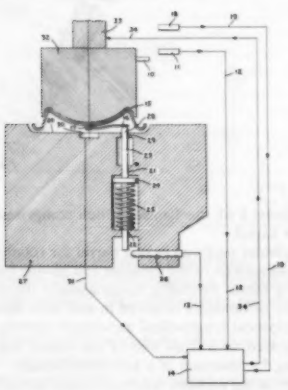
Kjell Sallnert, Malmö ; Carl-Erik Fridh, Trelleborg, and Manfred Hansson, Malmö, all of Sweden, assignors to Platmanufaktur AB, Malmo, Sweden

Filed Mar. 2, 1979, Ser. No. 16,877

Claims priority, application Sweden, Nov. 27, 1978, 7812169

Int. Cl.³ B21D *39/03, 51/00*; B23P *11/00*

U.S. Cl. 72—10 **5 Claims**



1. Apparatus for preventing the manufacture of defective products in connection with the production of metal can tops with a pull-up ring, said apparatus comprising a dolly for riveting a pull-up ring to a metal can top, drive means for driving said dolly from a starting position to a working position and back to the starting position, a tool seat located so that in said working position said dolly cooperates with said tool seat to rivet the pull-up ring to the metal can top with the pull-up ring facing said tool seat, transmitter means for sensing the passage of said dolly past a reference level and for sending a corresponding signal when said dolly is moving towards said seat, a sensing pin protruding from the surface of the seat to be moved towards the surface of the seat by said pull-up ring of the metal can top when said dolly is in said working position and the pull-up ring is being riveted to said metal can top, sensor means for sensing movement of said sensing pin and for the generation of a corresponding signal, and delay and control means for receiving said signals from said transmitter means and said sensor means for sending a signal to said drive means for stopping the movement of the dolly when a predetermined period of time between said signals is exceeded.

4,446,711

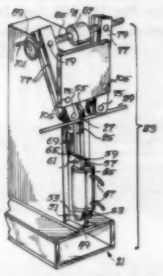
U-BOLT BENDER

Raymond L. Valente, Kankakee, Ill., assignor to Vale Industries, Inc., Pontiac, Ill.

Filed Aug. 18, 1982, Ser. No. 409,061

Int. Cl.³ B21D *7/08*

U.S. Cl. 72—213 **16 Claims**



2. In a U-bolt bender of the type including support structure, in combination with a workpiece having opposite end portions, said bender further including actuator means carried by said support structure for causing movement of said workpiece along a predetermined path, a die having a surface advanceable along said path and disposed transverse thereto and opposite side surfaces disposed transverse to and converging away from said die advanceable surface, clamping means for clamping said workpiece to said die, and slide means for moving said die along said path, said slide means carrying said die, wherein the improvement, in combination, comprises: first and second linkage means for pivotally connecting said actuator means to said clamping means, one of said first and second linkage means being pivotally connected at a first end portion thereof to said actuator means, being pivotally connected at a second end portion thereof opposite said first end portion to the other of said first and second linkage means, and being pivotally connected intermediate said first and second end portions thereof to said slide means, the other of said first and second linkage means being pivotally connected at a first end portion thereof to said one of said first and second linkage means and being pivotally connected at a second end portion thereof opposite said first end portion to said clamping means; first and second roller means carried by said support structure for urging said workpiece opposite end portions against respective ones of said die side surfaces, respective ones of said first and second roller means being disposed transverse to and on opposite sides of said path; and biasing means pivotally connected to said first and second roller means for causing one of said first and second roller means initially spaced by a first dimension from the other of said first and second roller means to be urged toward said other of said first and second roller means when spaced from said one of said first and second roller means by a second dimension relatively less than said first dimension, said actuator means including means for causing movement along said path of one of said die and said first and second roller means relative to the other of said die and said first and second roller means whereby for urging said workpiece between said first and second roller means, wherein said actuator means, said slide means, said clamping means and said first and second linkage means coact to clamp said workpiece to said die thereby producing a clamped workpiece, and wherein said actuator means, said clamping means, said die, said first and second linkage means and said slide means coact to advance said clamped workpiece along said path and to urge said clamped workpiece between said first and second roller means, whereby said first and second roller means engaging said workpiece opposite end portions coact with said die to urge

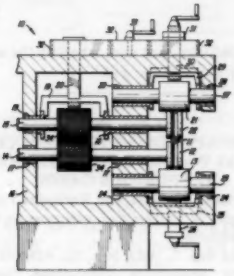
said workpiece opposite end portions against respective ones of said die side surfaces.

4,446,712

PROPPED CANTILEVERED ROLL STAND

Kenneth R. Stone, Carrollton, Ga., and Bapa R. Uppaluri, Sharon Hill, Pa., assignors to Southwire Company, Carrollton, Ga.

Filed Dec. 14, 1981, Ser. No. 330,292
Int. Cl.³ B21B *31/26*
U.S. Cl. 72—243 **4 Claims**



1. Apparatus for substantially eliminating deflection of cantilevered work roll shafts and work rolls of a cantilevered type rolling mill caused by resistance of metal stock to compressive forces applied by said work rolls during rolling of metal stock, comprising:

at least one support roller adjacent to each work roll and in the paths of deflection;

a support roller shaft upon which said support roller is concentrically mounted;

means for adjusting the longitudinal axis of said support roller toward and away from the longitudinal axis of said work roll further comprising a first set of at least two eccentric bearings secured to a frame member of said rolling mill, containing end portions of said support roller shaft, and having a longitudinal axis parallel to the longitudinal axis of said support roller shaft, a first yoke interconnecting said first set of eccentric bearings, and first rotation means for rotating said first yoke about the longitudinal axis of said first set of eccentric bearings;

means for adjusting the gap between said work rolls; and means for synchronizing movement of said longitudinal axis adjustment means of said support roller with movement of said roll gap adjustment means.

4,446,713

APPARATUS AND METHOD FOR BENDING INSULATED PIPING

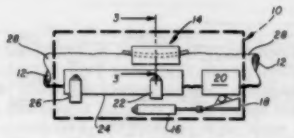
Lionel H. Wheeler, Houston, Tex., and Robert G. Goekler, Owasso, Okla., assignors to Crutcher Resources Corporation, Houston, Tex.

Filed Jul. 6, 1981, Ser. No. 280,488
Int. Cl.³ B21D *9/05*
U.S. Cl. 72—308 **27 Claims**

1. A bending die for use in a pipe bending machine for pipe coated with a compressible material comprising:

support structure for mounting on the pipe bending machine and having an inner surface;

a plurality of bars arranged along said inner surface of said support structure in pipe confronting relation for opposing bending forces through said compressible material, said bars being sufficiently spaced apart for flow of said compressible material between said bars as bending forces cause deformation of said compressible material to resist



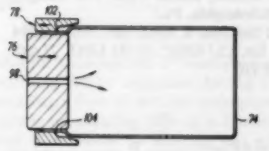
damage to the compressible material by relieving the stress in the compressible material.

4,446,714

METHODS OF NECKING-IN AND FLANGING TUBULAR CAN BODIES

Daniel S. Cvacho, 241 Kirkley Cir., Forest, Va. 24551

Filed Feb. 8, 1982, Ser. No. 346,586
Int. Cl.³ B21B *17/02*
U.S. Cl. 72—370 **9 Claims**



1. A method of necking in an end portion of a tubular member comprising the steps of

a. inserting a pilot die into a cylindrical member to be necked,

b. contacting the exterior surface of said member with a ring necking die,

c. reversing the direction of said pilot die to begin withdrawal of said pilot die from said member while moving said ring necking die in a direction of motion opposite to said pilot die thereby simultaneously effecting sliding motion against said member by both said pilot die and said ring necking die,

d. and continuing the motion of said dies in opposite directions while effecting necking in of the upper edge of said member by contact with said dies thereby producing a necked-in tubular member.

4,446,715

TRANSDUCER CALIBRATION SYSTEM

Wilber H. Bailey, Leucadia, Calif., assignor to Camino Laboratories, Inc., San Diego, Calif.

Filed Jun. 7, 1982, Ser. No. 385,492
Int. Cl.³ G01K *15/00*; G01L *27/00*
U.S. Cl. 73—1 R **17 Claims**

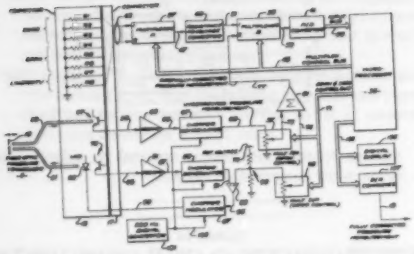
1. A system for selectively measuring one of a plurality of separate physical variables, comprising:

a plurality of transducer means, each adapted to monitor a separate physical variable and produce a signal indicative thereof, the signal differing from a desired relationship with the physical variable in a predetermined fashion;

a plurality of characterizing means, each associated with a separate transducer means and characterizing the difference between the signal produced by the transducer means and the desired relationship with the physical variable; and

a single correcting means, responsive to any selected one of

the individual transducer means and its associated characterizing means, for adjusting the transducer means signal



in a prescribed fashion, to produce a corrected measurement of the corresponding physical variable.

4,446,716

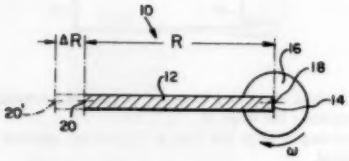
SELF-COMPENSATING CENTRIFUGE ARM

Howard M. Fishman, Elkins Park, Pa., assignor to Franklin Institute, Philadelphia, Pa.

Filed Jun. 8, 1982, Ser. No. 386,294

Int. Cl.³ G01C *25/00*; G01L *25/00*

U.S. Cl. 73—1 DC **12 Claims**



1. A self-compensating centrifuge arm for a centrifuge system having drive means for causing rotation of the centrifuge arm around a center of rotation, the centrifuge arm comprising:

a first elongated member attached to the drive means for rotation, the first elongated member having a first predetermined length and extending outwardly from the center of rotation in a first direction to a terminal end portion; and

a second elongated member having a second predetermined length and a first end attached to the first elongated member at the terminal end portion thereof, the second elongated member extending through the center of rotation without being affixed to the drive means and terminating at a second end.

4,446,717

ABRASIVE WEAR TESTER

Jerry R. Johanson, Chelmsford, and Thomas A. Royal, Arlington, both of Mass., assignors to Jenike & Johanson, Inc., No. Billerica, Mass.

Filed Jul. 28, 1982, Ser. No. 402,632

Int. Cl.³ G01N *3/56*

U.S. Cl. 73—7 **22 Claims**

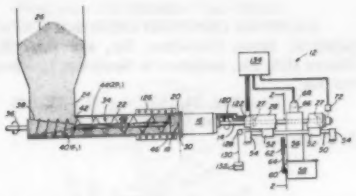
1. Apparatus for applying abrasive wear to a surface of a sample including, in combination,

support means for mounting the sample rotatably about and reciprocally along an axis,

a barrel for containing a flowable abrasive material extending along the axis and having an open end facing said surface,

means to feed the material in the barrel toward said surface at a controlled rate,

and means for urging the sample toward the barrel with a force opposed to that of the material on the sample, said controlled rate being sufficient to maintain a gap between



the sample and said open end, whereby the material flows continuously through the gap.

4,446,718

METHOD AND APPARATUS FOR REDUCING FALSE ALARMS IN GAS WARNING INSTALLATIONS CAUSED BY SPURIOUS GASES

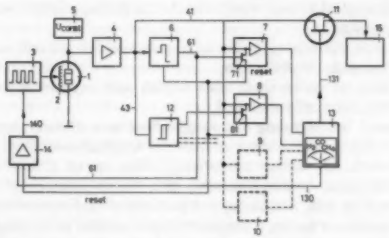
Stanislaw Bukowiecki, Uerikon, and Karlheinz Paglotke, Langnau a. Albis, both of Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

Filed Sep. 7, 1982, Ser. No. 415,038

Claims priority, application Switzerland, Sep. 22, 1981, 6115/81

Int. Cl.³ G01N *27/14*

U.S. Cl. 73—23 **7 Claims**



3. An apparatus for reducing false alarms in gas warning installations caused by spurious gases, comprising:

a gas-sensitive element constituted by a metal-oxide semiconductor;

a comparator for receiving a first output signal delivered by the gas-sensitive element;

a circuit for a first peak value which is turned-on by the output signal of the gas-sensitive element; and

an analog value-comparator which accomplishes a programmable change in the temperature of the metal-oxide semiconductor for discriminating the spurious gas.

4,446,719

ELECTROREFLECTANCE VIBRATIONAL SPECTROSCOPY

David K. Lambert, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 22, 1982, Ser. No. 400,869

Int. Cl.³ G01N *21/17*

U.S. Cl. 73—23 **4 Claims**

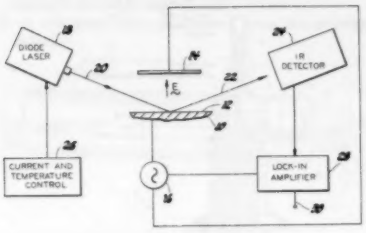
1. A method of obtaining the vibrational spectra of molecules adsorbed on a metal or insulator surface comprising the steps of:

establishing an electric field normal to the surface and amplitude modulating the electric field,

irradiating the surface with infrared radiation and varying

the radiation through a range of wavelengths corresponding to the range of vibrational absorption of the adsorbed molecules,

detecting radiation reflected from the surface, and



measuring the synchronous modulation of reflectivity while varying the radiation wavelength to obtain the spectra of vibrational absorption.

4,446,720

METHOD AND APPARATUS FOR DETECTING THE PRESENCE OF A CONTAMINANT IN A GASEOUS CARRIER

Ian Sinclair, Loughborough, England, assignor to The Secretary of State for Social Services in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

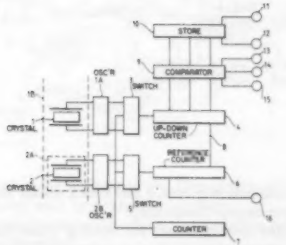
PCT No. PCT/GB81/00064, 371 Date Nov. 25, 1981, 102(e) Date Nov. 25, 1981, PCT Pub. No. WO81/03071, PCT Pub. Date Oct. 29, 1981

PCT Filed Apr. 10, 1981, Ser. No. 328,589

Claims priority, application United Kingdom, Apr. 18, 1980, 8012889

Int. Cl.³ G01N *27/00*

U.S. Cl. 73—23 **13 Claims**



1. Apparatus for detecting the presence of a contaminant in a gaseous carrier comprising a first piezo electric crystal oscillator (1), a carrier gas feed means (IB) for enabling contaminant to act upon the said first crystal (1) in a manner which changes the effective mass thereof, measuring means (4) for obtaining a first value related to the total number of oscillations of the crystal (1) during a first predetermined period of time, means for enabling the first value to be decreased by a second value related to the total number of oscillations of the crystal (1) during a second time period not greater than said first predetermined time period, testing means (10), said testing means being arranged to allow the first crystal (1) to oscillate for a second predetermined period of time, to obtain a value related to the number of oscillations of the first crystal (1) in said second predetermined period of time, and to compare said value with at least one other preselected value, whereby any change in mass of said crystal (1) due to previous use can be determined by said comparison, and a second piezo electric crystal oscillator (2) the output of which drives a counter (6) to determine the said first predetermined period of time and said second period of time.

4,446,721

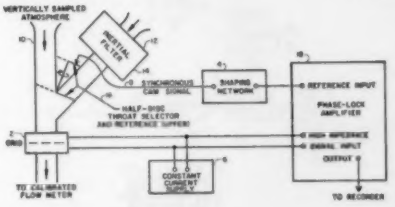
ATMOSPHERIC LIQUID WATER CONTENT MEASUREMENT AND CALIBRATION SYSTEM

Charles W. Bruce, Las Cruces, N. Mex., and Ralph J. Brewer, Zurich, Switzerland, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 30, 1981, Ser. No. 307,136

Int. Cl.³ G01N *27/06*

U.S. Cl. 73—29 **6 Claims**



1. Apparatus for measurement of atmospheric liquid water content comprising intake apparatus having a first throat means for sampling a flow of ambient atmosphere, and a second throat means for sampling flow of a filtered atmosphere and an inertial filter means for filtering said atmosphere by removing droplets of water;

selection means for cyclically and alternately sampling the inputs from said first and second throats;

a wire grid heater over which said flow from said selection means passes;

a phase lock amplifier;

electrical synchronizing means coupled to said selection means to supply a reference signal to said phase lock amplifier;

a constant current source connected to said wire grid and also in parallel to a high impedance input of said phase lock amplifier, such that said wire grid is heated to evaporate water droplets encountered and a voltage across the grid proportional to its resistance is applied as an input signal to the phase lock amplifier, and said phase lock amplifier operating to supply an output which is the rms value of the difference signal between the half cycles of said reference signal, whereby the wafer vapor component as opposed to the water droplet component of sampled ambient atmosphere is eliminated to thereby measure the liquid water content.

4,446,722

VIBRATION SENSOR, PARTICULARLY KNOCK SENSOR FOR INTERNAL COMBUSTION ENGINES

Manfred Boruschewitz, and Hansjoachim Hamisch, both of Berlin, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 21, 1982, Ser. No. 390,171

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1981, 3126676

Int. Cl.³ G01L *23/22*

U.S. Cl. 73—35 **11 Claims**

1. Vibration sensor to sense vibration of a body (9, 13, 27), particularly to sense vibration due to knocking of an internal combustion engine, having

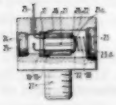
a base (7, 17) secured to the body, the vibration of which is to be sensed;

at least one piezoelecric element (4, 5, 15, 19) located in vibration-transmitting contact with said body;

an elongated elastic element (**1**, **21**, **31**) having a free end portion (**2**) having elongated transverse to the direction of vibration of said body for free vibration in the direction of the body vibration

and comprising

resilient clamping means (**6**, **7**, **8**; **12**; **20**, **21***a*, **23***a*) for resiliently clamping one end portion of the elastic element in surface contact with the at least one piezoelectric element for vibratory or oscillatory transmitting contact with the at least one piezoelectric element;



wherein the said one end portion is wavy or undulating, and a valley or trough of the waves or undulations is in essentially line engagement with a surface of the piezoelement element;

and the clamping means comprise resilient engagement means of said wavy or undulating portion to provide for said elastic clamping engagement of said one end portion with respect to the piezoelectric element.

4,446,723

OPTICAL COMBUSTION EVENT SENSOR STRUCTURE PARTICULARLY KNOCK SENSOR FOR AN INTERNAL COMBUSTION ENGINE

Bernward Böning, Ludwigsburg; Rainer Bone, Vaihingen; Rudolf Nagel, Asperg; Franz Sellmaier, Schwieberdingen, and Helmut Reum, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 1, 1982, Ser. No. 344,409

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3110997

Int. Cl.[3] **G01L** *23/22*

U.S. Cl. 73—35 **10 Claims**

1. Knocking sensor structure to obtain a signal representative of temperature characteristics of combustion events within a combustion chamber of an internal combustion engine, (ICE),

in combination with means (**10***b*) for defining the combustion chamber of the internal combustion engine,

the sensor structure having

a spark plug structure including a tubular housing (**10***a*) formed with means for securing the housing into a wall (**10***b*) defining one side of the combustion chamber;

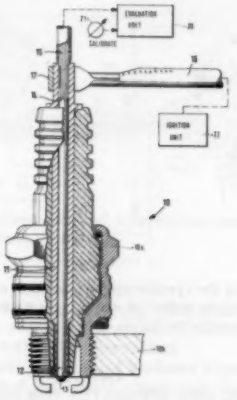
a center electrode (**11**) insulatingly passing through the tubular housing;

light sensitive means (**15**) retained in the housing;

a light pick-up means (**12**) retained in the housing having a sensing portion at an end portion of the pick-up means, lcated within the combustion chamber, and being coupled to the light sensitive means at an other end of the pickup means said pickup means further comprising

a layer of graphite, located at said sensing end and located within the combustion chamber which layer is heat resistant and, when subjected to the temperature of the combustion chamber during occurrence of combustion events therein, becomes light emitting;

emission of light being sensed by the sensing end portion of



the pick-up means, and transmitted to the light sensitive means, the light emission being representative of the temperature to which said graphite layer is being raised as a consequence of combustion events.

4,446,724

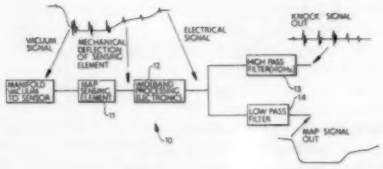
ENGINE PRESSURE AND KNOCK SENSOR

Louis R. Focht, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 30, 1982, Ser. No. 431,983

Int. Cl.[3] **G01L** *23/22, 23/24*

U.S. Cl. 73—35 **4 Claims**



1. A combination pressure and knock sensor for and internal combustion engine comprising:

a pressure sensing means for sensing intake manifold absolute pressure and having an output for providing a signal;

a high pass filter means having an input coupled to said output of said pressure sensing means for passing a high frequency knock signal; and

a low pass filter means having an input coupled to said output of said pressure sensing means for passing a low frequency pressure signal.

4,446,725

VOLUMETRIC ANALYSIS DEVICE FOR DETERMINING THE DRY RUBBER CONTENT OF LATEX

Frank C. Schulz, Jr., Cooper Hill, North Creek, N.Y. 12853

Filed May 25, 1982, Ser. No. 382,044

Int. Cl.[3] **G01N** *15/06*

U.S. Cl. 73—61 R **8 Claims**

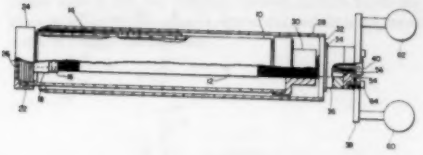
1. A volumetric analysis device for determining the solids content of a liquid composition comprising:

A. An elongated cylinder, having a removable filter cap positioned at one end;

B. A compression plunger mounted upon one end of an axial shaft reciprocably positioned within said cylinder, so as to compress a liquid batch contained within said cylinder, while urging liquid residue through said filter cap;

C. A handle connected to a portion of said shaft extending through the other end of said cylinder;

D. A reference scale positioned upon the exterior of said cylinder;



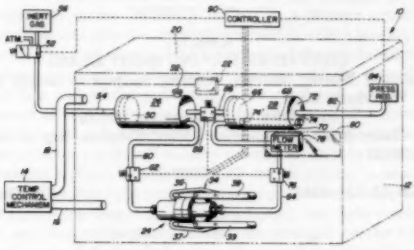
E. An open-ended cylindrical dial drum connected to that portion of said shaft extending through said cylinder, such that reciprocal movement of said axial shaft and plunger within said cylinder is reflected correspondingly in reciprocal movement of said dial drum with respect to said reference scale upon the exterior of said cylinder.

4,446,726

APPARATUS AND METHOD FOR MEASURING THE FILTERABILITY OF A FLUID AT LOW TEMPERATURES

Richard L. Hockenberry, Viola, Ill., assignor to Deere & Company, Moline, Ill.

Filed Sep. 1, 1982, Ser. No. 413,849
Int. Cl.³ G01N *33/26*
U.S. Cl. 73—61.4 **14 Claims**



1. An apparatus for measuring the filterability of a fluid at low temperatures, said apparatus comprising:

(a) a container having a temperature regulating mechanism connected thereto;

(b) a filter holder enclosed in said container and including a two part housing joined together by a quick attachment and release mechanism, said filter holder having a fluid inlet and a fluid outlet and retaining a filter therebetween;

(c) a first cylinder containing a free piston and housing a quantity of fluid therein, one end of said first cylinder being connected to said inlet of said filter holder and an opposite end of said first cylinder being connected to a supply of pressurized gas;

(d) a second cylinder containing a free piston and housing a quantity of a gas, one end of said second cylinder being connected to said outlet of said filter holder and an opposite end of said second cylinder being connected to a pressure regulator;

(e) a flow meter positioned between said filter holder and said second cylinder for recording fluid flow therebetween; and

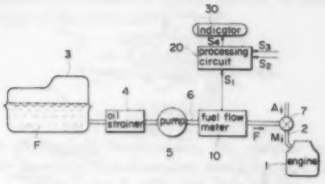
(f) control valves situated on said inlet and outlet sides of said filter holder for regulating the flow of said fluid from said first cylinder to said second cylinder.

4,446,727

METHOD FOR INTEGRATING FUEL CONSUMPTION AMOUNT OF VEHICLES

Norimitsu Kurihara, Saitama, and Takeshi Imai, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1982, Ser. No. 403,002
Claims priority, application Japan, Jul. 31, 1981, 56-120242
Int. Cl.³ G01F *9/02*
U.S. Cl. 73—113 **7 Claims**



1. In a vehicle provided with an internal combustion engine, a carburetor which supplies fuel to said internal combustion engine, and a turbine-type fuel flow meter which detects the flow rate of fuel supplied to said carburetor, a method for integrating the amount of fuel consumption, comprising the steps of:

summing the flow rate detected by said fuel flow meter at each prescribed time;

comparing a quantity relating to the vehicle speed in a mean value at said prescribed time with a given reference value;

selecting one from at least two prescribed correction factors based on the comparison and correcting the corresponding sum value of fuel flow rate by multiplying by the selected factor; and

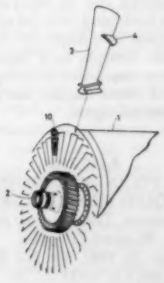
integrating the corrected value of fuel flow rate.

4,446,728

ROTARY DRIVE DEVICE FOR INSPECTING TURBO-FAN ENGINE BLADES

Tomoo Ito, Futtu, Japan, assignor to Jupitor Corporation, Tokyo, Japan

Filed Jun. 9, 1982, Ser. No. 373,696
Claims priority, application Japan, Jan. 26, 1982, 57-9475
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—116 **6 Claims**



4. A blade inspection method for a turbo-fan engine comprising the steps of mounting the rotary drive device on a turbo-fan blade;

maintaining the pulley of said rotary drive device in frictional contact with the internal wall of the turbo-fan case; and

activating the motor to rotate the turbo-fan relative to the turbo-fan case.

4,446,729

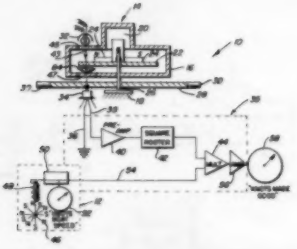
SAILING COURSE COMPUTER

Roy H. A. Watson, III, 124 Dodds Ct., Burlington, Vt. 05401

Filed Oct. 23, 1981, Ser. No. 314,478

Int. Cl.³ G01C *21/10*

U.S. Cl. 73—178 R **8 Claims**



1. A sailing course computer for instantaneously and continuously indicating the speed of a sailboat through a body of water towards a destination, said computer comprising:

speed determining means for providing a first signal representative of said sailboat's velocity through said body of water along a path of forward movement;

direction indicating means for providing a second signal proportional to an angle determined by an intersection of a first line directed from said sailboat to said destination and a second line directed along said path of forward movement of said sailboat:

computing means for combining said first and second signals to indicate said speed of said sailboat toward said destination irrespective of the instantaneous direction of movement of said sailboat through said body of water, said computing means being operable to determine said speed toward said destination by multiplying an absolute value of said sailboat's velocity by a cosine of said angle, and including an electronic circuit having an operational amplifier mode to effect said multiplication of the velocity and said cosine of said angle, said direction indicating means including compass card means rotatable about an axis for indicating a North and South direction and bezel means circumferentially positioned about the compass card means, said compass card means being constructed of a polarizing material and an analyzer disk means also constructed of a polarizing material and positioned proximate to the compass card means for regulating light passing through said compass card means during rotation thereof, and means responsive to the light passing through the compass card means and the analyzer disk means for producing the second signal.

4,446,730

SPECIFIC GRAVITY INDEPENDENT GAUGING OF LIQUID FILLED TANKS

George E. Smith, Houston, Tex., assignor to Quintex Research International, Inc., Missouri City, Tex.

Filed Apr. 26, 1982, Ser. No. 371,789

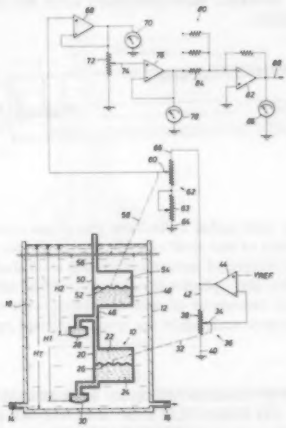
Int. Cl.³ G01F *23/18*

U.S. Cl. 73—301 **13 Claims**

1. The method of measuring the level of fluid in a tank, which comprises

establishing a first voltage level with a first pressure sensing device sensitive to the pressure difference between a first and second level within the tank, said first voltage being exponentially proportional to the reciprocal of the specific gravity of the fluid, and

with respect to the first voltage level as a reference voltage level, establishing a second voltage with a second pressure



sensing device of the absolute pressure at one of said first and second levels, the second voltage being directly proportional to the specific gravity of the fluid, the resulting output of voltage of said second pressure sensing device being a measure of the fluid level in the tank only, and being independent of the specific gravity of the fluid.

4,446,731

CONTAINER HAVING SIGHT GLASS

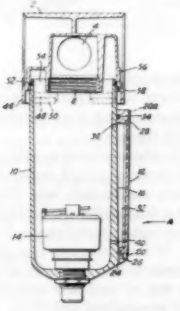
Keith S. Martin, Stafford, England, assignor to Scovill Inc., Waterbury, Conn.

Filed Sep. 4, 1981, Ser. No. 299,411

Claims priority, application United Kingdom, Sep. 5, 1980, 8028833

Int. Cl.³ G01F *23/02*

U.S. Cl. 73—334 **4 Claims**



1. A fluid container having a bowl and an attached overhanging cap, the bowl defining a vessel including a flat, generally vertical sidewall portion surrounded, except at its upper end, by a flanged lip defining a receiving opening, the lip being tapered slightly away from the flat vertical sidewall portion as the upper end of the receiving opening is approached, and an elongate light-transmitting sight glass member having a trough-like internal space extending centrally of its width

along its length except adjacent its ends, the flat vertical sidewall portion being formed with at least one passage into the bowl aligned with the trough, the sight glass member having a peripheral rim, thickening as its upper end is approached and resilient sealing means disposed on the sight glass member rim, the sight glass peripheral rim being held by the flanged lip in frictional and sealing engagement against the flat vertical sidewall portion whereby the frictional engagement of the sealing means against the flat vertical sidewall portion holds the sight glass member firmly against any undesired upward movement without the use of fasteners.

4,446,732

CRANKSHAFT BALANCE CENTERING

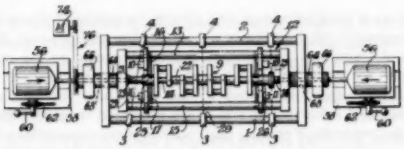
Harald Schoenfeld, Darmstadt-Arheilgen, Fed. Rep. of Germany, assignor to Carl Schenck AG, Fed. Rep. of Germany

Filed Jun. 3, 1982, Ser. No. 384,191

Claims priority, application European Pat. Off., Jun. 6, 1981, 81104386.8

Int. Cl.³ G01M *1/16*

U.S. Cl. 73—461 **3 Claims**



1. An arrangement for interrupting the dislocation of a crankshaft during centering thereof in a balance centering machine, whereby the machine is provided with a bearing bed below a swing bridge in which bearing bed the crankshaft to be balance centered is arranged to rotate around the axis of the machine and whereby the axis of the crankshaft may be displaced in relation to the axis of the machine until a minimal rotation radius has been obtained for a point on the surface of two selected crankshaft sections rotating around the axis of the machine without eccentricities due to the system, characterized in that two light emitters each for producing a sharp beam of light are arranged on the swing bridge, two light receivers in opposite positions to the emitters arranged on the swing bridge, the light beams crossing the axis of the balancing machine at a predetermined minimum radius distance, and means for moving the crankshaft to be balanced relative to the axis of the machine at several locations along the crankshaft axis until a receiver captures the first light over a section of the crankshaft and immediately thereafter interrupting such movement at that location.

4,446,733

STRESS CONTROL IN SOLID MATERIALS

Shigeo Okubo, Menlo Park, Calif., assignor to Design Professionals Financial Corporation, Monterey, Calif.

Filed Aug. 17, 1981, Ser. No. 293,751

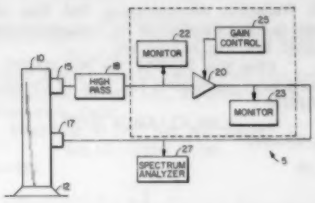
Int. Cl.³ G01H *13/00*

U.S. Cl. 73—579 **13 Claims**

1. A method of subjecting a structure to stress comprising the steps of:

determining at least some of the higher resonant frequencies of the structure, said higher resonant frequencies lying above the fourth harmonic; and

applying stress to the structure at at least one of said higher resonant frequencies to induce stress waves having points



of maximum moment at a large number of points on the surface of the structure.

4,446,734

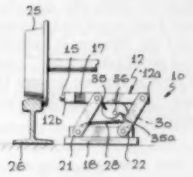
MOTOR DRIVEN EXCITER

Kenneth G. Empson, Montgomery, Ill., assignor to Southern Pacific Transportation Company, San Francisco, Calif.

Filed Jan. 8, 1982, Ser. No. 337,984

Int. Cl.³ B06B *1/12*; G01N *29/04*

U.S. Cl. 73—586 **6 Claims**



1. Apparatus for striking a moving train wheel, comprising:

a hammer unit which includes a hammer, means for supporting said hammer in movement toward and away from the path of the moving train wheel, a spring which urges said hammer towards the path of the wheel when the hammer is held away from the path of the wheel, and means for moving said hammer away from the path of the wheel in opposition to the force of the spring and for releasing the hammer to allow its movement by said spring against a moving train wheel;

said hammer including front and rear members, said spring and moving means coupled to said rear member, and said front member lying closest to said train wheel path and having a head that strikes a train wheel, at least said head moveable, relative to said rear member, by a limited distance perpendicular to hammer movement toward and away from said wheel path.

6. Apparatus for striking a moving train wheel, comprising:

a hammer unit which includes a hammer, means for supporting said hammer in primarily horizontal movement toward and away from the path of the moving train wheel, a spring which urges said hammer towards the path of the wheel when the hammer is held away from the path of the wheel, and means for moving said hammer away from the path of the wheel in opposition to the force of the spring and for releasing the hammer to allow its movement by said spring against a moving train wheel;

said means for supporting said hammer including a base mounted to the ground and a pair of substantially parallel arms having inner ends pivotally connected to said base and outer ends pivotally connected to spaced locations on said hammer.

4,446,735

METHOD OF TESTING THE WEIGHT PER UNIT AREA OF THIN MATERIAL

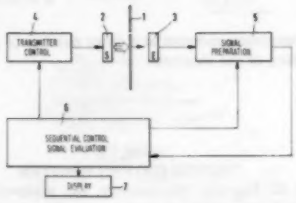
Karl H. Weilacher, Ampermoching, Fed. Rep. of Germany, assignor to GAO Gesellschaft fur Automation und Organisation mbH, Fed. Rep. of Germany

Filed Nov. 20, 1981, Ser. No. 323,315

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048710

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—597 7 Claims



1. A method for the contactless determination of the weight per unit area and/or the thickness of thin material such as paper, foils and the like, whereby a transmitter exposes the material pulsatively to ultrasonic waves and a receiver picks up the sound vibrations from the material wherein the sound propagation time T_d between said transmitter and said receiver is determined and the receiver is switched on after a delay as long as the sound propagation time T_d and is switched off after the elapse of a time period no greater than double the sound propagation time T_d, before interferences caused by the system arrive at said receiver.

4,446,736

ULTRASONIC IDENTIFICATION OF DAMAGE IN LINED STRUCTURES

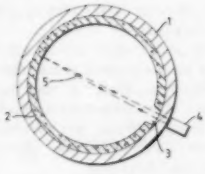
Peter Jackson, Stockton-On-Tees, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Sep. 24, 1981, Ser. No. 305,354

Claims priority, application United Kingdom, Oct. 10, 1980, 8032874

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—600 2 Claims



1. A method for testing the integrity of an internal lining on the wall of a hollow body at a given location comprising arranging an ultrasonic wave transmitter and an ultrasonic wave receiver exteriorly of the hollow body at said location, generating an ultrasonic wave with the transmitter and transmitting the wave through the wall at said location in a manner such that any transmitted wave which penetrates the wall and the lining, if any, at said location passes through the interior of the hollow body to a point opposite said location and is reflected back toward said location, and detecting any such reflected wave with the receiver at said location, the absence of a reflected wave being an indication of total attenuation by the wall and the lining at said location and hence an indication of the presence of the lining at said location, the presence of a reflected wave being an indication of less than total attenuation by the wall and the lining, if any, at said location and hence an indication of an absence of or a reduced thickness of the lining at said location.

4,446,737

METHOD AND DEVICE FOR MEASURING OBJECTS USING ULTRASOUND ECHOGRAPHY

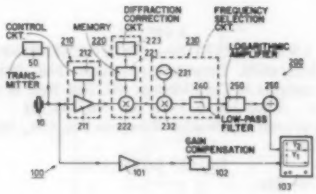
Francois Hottier, La Varenne, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 9, 1983, Ser. No. 492,849

Claims priority, application France, Oct. 13, 1982, 82 17141

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—602 10 Claims



1. In a device for scanning objects by means of ultrasound echography of the type which comprises at least one ultrasound transducer, transmitter means connected to the transducer for repeated transmission of ultrasound energy, and receiver means connected to the transducer for receiving ultrasound echo signals which are produced from reflections of the transmitted energy, said receiver means comprising first processing circuit means for said echo signals which includes a first amplifier which is connected to receive signals from the output of the transducer, gain compensation means; and display means for displaying the position of the origin of the echo signals together with the amplitude of the echo signals, the improvement wherein:

the receiver means further comprise second processing means, connected in parallel with the first processing circuit means, which include, in functional series connection, automatic gain control means which increase the gain of the second processing circuit means as a function of the distance of the position of the origin of the echo signals from the transducer; diffraction correcting means which correct the amplitude of the echo signals for diffraction effects produced by the transducer; frequency selection means which pass echo signals in a narrow frequency band which is centered around a frequency F_c within the bandpass of the transducer; a first logarithmic amplifier; and means which divide the output signal of the first logarithmic amplifier by a factor which is proportional to the frequency F_c and apply the divided output signal to a display means.

4,446,738

ACOUSTIC SCANNING MICROSCOPE

Isao Ishikawa, Hino; Hiroshi Kanda, Tokorozawa, and Kageyoshi Katakura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 14, 1981, Ser. No. 330,779

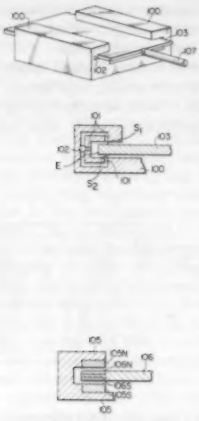
Claims priority, application Japan, Dec. 22, 1980, 55-180397

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—606 15 Claims

1. In an acoustic microscope comprising an acoustic wave propagating medium, a piezo-electric element formed at one end of said acoustic wave propagating medium, and an acoustic wave lens formed at the other end of said propagating medium and having a focal point at a predetermined position, wherein an image of a specimen located at said focal point is produced on the basis of the acoustic wave disturbed by said

specimen, an improvement comprising supporting means for supporting a specimen table for said specimen in a non-contacting manner, said table having oppositely facing side surfaces,



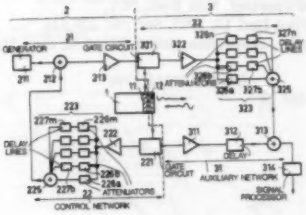
said supporting means being constituted by bearing members for supporting said specimen table under aerostatic pressure at least at portions along the oppositely facing side surfaces.

4,446,739

ECHO ULTRASOUND EXAMINATION DEVICE WITH MULTI-LAYER TRANSDUCER

Roger-Henri Coursant, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 21, 1981, Ser. No. 332,994
Claims priority, application France, Dec. 22, 1980, 80 27202
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—609 **11 Claims**



1. In an echo ultrasound examination apparatus which comprises:

a multi-layer transducer which includes a first active layer for transmitting ultrasound energy in response to an electrical stimulation signal and a second active layer for detecting ultrasound echos and producing electrical echo signals in response thereto;

transmission network means which are operably connected to the first layer to supply stimulation signals thereto; and

receiver network means which are operatively connected to the second layer to receive echo signals therefrom;

the improvement comprising:

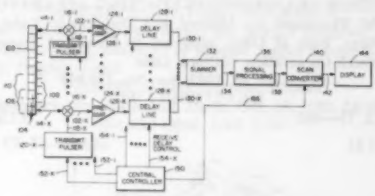
control network means, having an input which is operably connected during transmission of ultrasound energy to a first signal supply layer of the transducer, which feedback a signal to correct the transfer function of the transmission network means and thus reduce interference between the transmission network means and the receiver network means.

4,446,740

FREQUENCY CONTROLLED HYBRID ULTRASONIC IMAGING ARRAYS

David A. Wilson; James L. Buxton, both of Palo Alto, and Philip S. Green, Atherton, all of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Mar. 9, 1982, Ser. No. 356,467
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—626 **46 Claims**



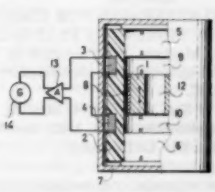
1. An ultrasonic imaging apparatus, which comprises: an array of transducer elements for transmitting ultrasonic signals having a first predetermined center frequency into an object to be examined through use of the transmitted signals reflected from within the object, means connected to transmit the ultrasonic signals from said array in a stepped array mode, means connected to transmit the ultrasonic signals from said array in an angle scanning mode, means for transmitting the signals to a desired depth within the object, the detected echoes from a particular depth sensed by the apparatus having a corresponding second center frequency less than the first center frequency as a result of signal attenuation by the object, and means connected to select automatically between said stepped array transmitting means and said angle scanning transmitting means so that at least some of the transducer elements are selectively used to transmit in both the stepped array mode and the angle scanning mode for operating said array elements based on the detected second center frequency.

4,446,741

VIBRATION TRANSDUCER

Jurij Sirokorad, and Jiri Vecera, both of Brno, Czechoslovakia, assignors to Prvni brnenska strojirna, narodni podnik, Brno, Czechoslovakia

Filed Jun. 1, 1981, Ser. No. 268,697
Int. Cl.³ G01H *11/00*
U.S. Cl. 73—654 **4 Claims**



1. An induction vibration transducer for measuring vibrations and shocks, comprising an elongated sleeve, an induction coil wound about the exterior of the sleeve, a first permanent magnet movably mounted within the sleeve for movement axially thereof, and second and third permanent magnets mounted on the sleeve in axially spaced positions thereon so as to provide free spaces between the inner pole pieces thereof and the confronting poles of the movable permanent magnet,

the pole of the second and third fixed permanent magnets confronting poles of the same polarity on the first movable permanent magnet, the induction coil being composed of pseudobifiliary wound induction coils disposed on the outer surface of the sleeve at the location of the interpolar spaces between the respective second and third, fixed permanent magnets and the first movable permanent magnet, the first, movable permanent magnet having a central opening therethrough which provides for the free exchange of gas between the spaces within the sleeve at the opposite ends of the first, movable permanent magnet.

4,446,742

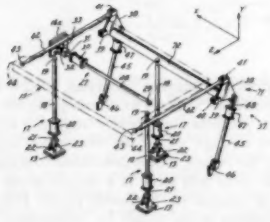
MOTION TRANSMISSION LIMITING APPARATUS

Jack M. Thompson, Jr., Milford, and Theodore H. Leist, Jr., Bethany, both of Ohio, assignors to Structural Dynamics Research Corporation, Milford, Ohio

Filed Jan. 18, 1982, Ser. No. 339,845

Int. Cl.³ B06B *1/10*

U.S. Cl. 73—663 **3 Claims**



1. A seismic testing apparatus comprising:

a fixed base;

a rigid table horizontally disposed a spaced distance above said base;

excitation means for moving said table linearly along a predetermined X-axis, said excitation means including a pivot member connected to said table and to an actuator, said actuator being adapted to pivot said pivot member and in turn move said table along said predetermined X-axis;

excitation means adapted to simultaneously move said table linearly along an axis transverse to the X-axis;

means connected between said base and said pivot member for preventing motion of said pivot member in said transverse direction and thereby preventing said linear motion of said table transverse to said X-axis from being transmitted via said pivot member to said actuator of said X-axis excitation means.

4,446,743

METHOD AND APPARATUS FOR EDGEWISE COMPRESSION TESTING OF FLAT SHEETS

Dennis E. Gunderson, Madison, Wis., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 152,874, May 23, 1980, Pat. No. 4,343,189. This application Apr. 8, 1982, Ser. No. 366,754

Int. Cl.³ G01N *11/00*

U.S. Cl. 73—822 **4 Claims**

1. An apparatus for edgewise compression testing of a flat sheet, comprising:

(a) means for restraining said sheet from buckling in the lateral direction, comprising:

(1) a sheet-supporting surface, flexible in the directions of test loading, on one side of said sheet, comprising:

(a) a plurality of lateral support leaves capable of being easily flexed in one test direction;

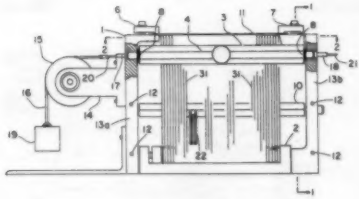
(b) spacing means at the base of said leaves whereby said leaves are clamped together and supported;

(c) enclosure means substantially surrounding said leaves such that a specimen in a position to be tested on said leaves comprises a boundary between said enclosure means at a lower air pressure and the ambient at a higher air pressure, and to which enclosure means said spacing means are attached; and

(d) aligning means for providing a fixed spacing between said leaves, comprising:

(1) an alignment frame located inside said enclosure means and surrounding said leaves;

(2) a plurality of wires stretched across said alignment frame equidistantly, each wire having one end



attached to one side of aid alignment frame and the other end attached to the opposite end of said alignment frame, with each wire located between two of said leaves; and

(3) means for raising and lowering said alignment frame;

(2) air pressure on the unsupported side of said sheet exceeding that on the support side of said sheet;

(b) means for holding said sheet adjacent to said restraining means during testing; and

(c) means for placing a load on said sheet in a desired direction.

4,446,744

ULTRASONIC FLOWMETER

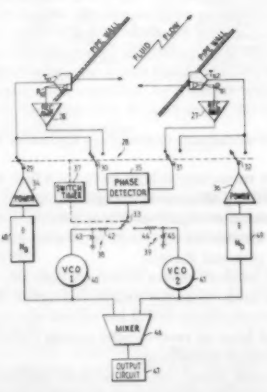
Kenneth E. Bearcroft, Lichfield, England, assignor to ITT Industries, Incorporated, New York, N.Y.

Filed Dec. 10, 1981, Ser. No. 329,524

Claims priority, application United Kingdom, Jan. 23, 1981, 8102152

Int. Cl.³ G01F *1/66*

U.S. Cl. 73—861.28 **3 Claims**



3. A flowmeter comprising: a pipe section having an axis and a first transmitting transducer at one location on said pipe section to transmit vibrational energy in a line approximately

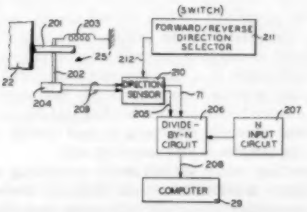
through said axis at an acute angle relative thereto; a first receiving transducer at a second location on said pipe section approximately on said line facing said first transducer; a second transmitting transducer at said second location approximately on said line; a second receiving transducer at said first location facing said second transmitting transducer; first and second receiving amplifiers connected from said first and second receiving transducers, respectively; a first voltage controlled oscillator (VCO); a second VCO; first and second power amplifiers connected from first and second VCO's, respectively; a phrase detector having first and second inputs and an output; first, second, third, fourth and fifth switches; a switch timer to operate said switches synchronously, said first switch alternately connecting and disconnecting said first power amplifier from said first transmitting transducer while the remainder of said switches are in first and second positions, respectively, said second switch being connected to one phase detector input alternately from said first transmitting transducer and said second receiving amplifier in said first and second positions, respectively, said third switch connecting the other input of said phase detector alternately to said first receiving amplifier and to said second transmitting transducer in said first and second positions, respectively, said fourth switch alternately disconnecting and connecting said second power amplifier from said second transmitting transducer in said first and second positions, respectively, said fifth switch connecting the output of said phase detector alternately to said first and second VCO's when in said first and second positions, respectively; difference means responsive to the output of said first and second VCO's for producing a main signal proportional to the difference between the output frequencies of said first and second VCO's; and an output circuit connected from said difference means to produce an indication of the magnitude of said main signal.

4,446,745

APPARATUS FOR COUNTING TURNS WHEN MAKING THREADED JOINTS INCLUDING AN INCREASED RESOLUTION TURNS COUNTER

Lyndon R. Stone, San Antonio, and James D. Hall, Austin, both of Tex., assignors to Baker International Corporation, Orange, Calif.

Filed Apr. 10, 1981, Ser. No. 253,118
Int. Cl.³ G01L 5/24
U.S. Cl. 73—862.25 **10 Claims**



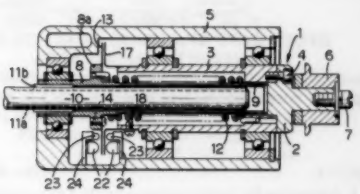
1. In an apparatus for making threaded joints from a pair of threaded members including means for rotating one of the members with respect to the other member and means for generating a signal representing the actual turns made by the one member, the actual turns signal generating means comprising: means responsive to the rotation of the one member for generating a first plurality of pulses at a first frequency proportional to the speed of rotation of the one member, said means for generating said first plurality of pulses including an idler wheel engaging the outer surface of the one member, an encoder means for generating said first plurality of pulses upon rotation thereof, and means coupling said idler wheel in driving relationship to said encoder means; and means responsive to said first plurality of pulses for generating said actual turns signal as a second plurality of pulses at a second frequency lower than said first frequency, said means for generating said second plurality of pulses including means for dividing said first plurality of pulses by a predetermined number N to generate said second plurality of pulses, the value of said predetermined number N being equal to a first value representing the outside diameter of the one member divided by the diameter of said idler wheel, multiplied by a second value representing the number of pulses generated by said encoder means per revolution of said idler wheel divided by a number of pulses desired per revolution of the one member.

4,446,746

TORQUE DETECTING APPARATUS

Shozo Aoshima; Noboru Hirose, and Michio Ishikawa, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 9, 1981, Ser. No. 310,410
Claims priority, application Japan, Oct. 29, 1980, 55-151645
Int. Cl.³ G01L 3/12, 3/14
U.S. Cl. 73—862.33 **14 Claims**



1. An apparatus for detecting torque transmitted between a driving rotary member and a driven rotary member mounted on a frame for rotation about a common axis, comprising:

transmitting means, disposed between said driving and driven rotary members, for transmitting rotary motion from said driving rotary member to said driven rotary member, said transmitting means permitting said rotary members to produce a relative angular displacement with respect to each other in proportion to the magnitude of a load applied to said driven rotary member, said angular displacement being held within a range less than 360 degrees;

a wheel disk attached to one of said driving and driven rotary members and having a plurality of detectable portions spaced from each other along a circle concentric with said axis;

first detecting means, disposed on said frame adjacent to said wheel disk, for detecting said detectable portions of said wheel disk and generating detecting signals corresponding to said detectable portions detected during rotation of said driving rotary member;

a shutter disk attached to the other of said rotary members adjacent to said wheel disk and having a single shutter portion formed thereon so as to cover a partial circumference of said circle, said shutter portion selectively covering consecutive ones of said detectable portions and thereby preventing said first detecting means from detecting the consecutive detectable portions covered by said shutter portion, said shutter portion being movable relative to a specific one of said detectable portions in response to said relative angular displacement and thereby changing the number of the detectable portions which are exposed with respect to said shutter portion to be detected by said first detecting means;

second detecting means, disposed on said frame opposite to said wheel and shutter disks, for detecting a resetting portion formed in one of said wheel and shutter disks, said second detecting means generating a resetting signal in

each rotation of said wheel and shutter disks when said resetting portion is detected; and

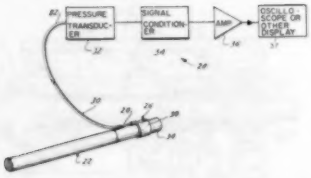
processing means connected to said first and second detecting means and comprising a counter for counting the number of said detecting signals generated from said first detecting means to detect the number of the exposed detectable portions, said counter being reset by said resetting signal, whereby said relative angular displacement is detected in each rotation of said rotary members.

4,446,747

METHOD AND APPARATUS FOR TESTING LIP PRESSURE APPLIED TO A SMOKING ARTICLE AND FOR CALIBRATING THE PRESSURE TESTING APPARATUS

Roger D. Kamm, 77 Marion Rd., Watertown, Mass. 02172

Filed Mar. 11, 1982, Ser. No. 356,979
Int. Cl.³ G01L *1/02*
U.S. Cl. 73—862.58 **15 Claims**



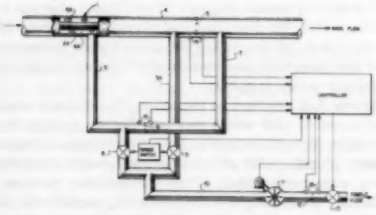
1. Apparatus for testing pressure applied to a smoking article comprising; a pressure sensor intended to be positioned on a predetermined portion of a smoking article to be subjected to external pressure, means for holding said sensor on the smoking article, a pressure transducer connected to the sensor, and means connected to the transducer to indicate the output of the transducer responsive to the pressure applied to the smoking article and sensed by the sensor.

4,446,748

PROPORTIONAL FLOW SAMPLER

William H. Clingman, Dallas, and Kenneth R. Hall, College Station, both of Tex., assignors to Precision Machine Products, Inc., Dallas, Tex.

Filed Nov. 27, 1981, Ser. No. 325,312
Int. Cl.³ G01N *1/22*
U.S. Cl. 73—863.03 **3 Claims**



1. Apparatus for taking a proportionally constant flowing sample from a gas stream flowing through a main gas flow line at rates subject to variation comprising:

a bypass line extending out of said main gas line and reentering said main line downstream from the point of said extending out;

a first orifice plate mounted in said bypass line;

a main sample line extending out of said bypass line and extending toward a point of sample processing;

a second orifice plate mounted in said sample line;

a third orifice plate mounted in said main gas line;

an alternate sample line extending out of said main gas flow line at a point upstream of said third orifice plate and extending to said main sample line at a point upstream from said second orifice plate.

means for detecting the magnitudes of the pressure drops across said orifice plates;

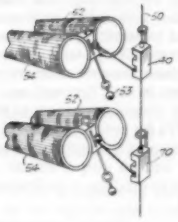
means for altering the pressure and flow conditions obtained adjacent said second orifice plate to match those obtained at said first orifice plate, to thereby establish flow through said main sample line at a constant proportion of the flow through said main gas flow line.

4,446,749

AQUATIC SPECIMEN RETRIEVAL FRAME

James K. Low, 8460 SW. 68 St., Miami, Fla. 33143

Filed Mar. 26, 1981, Ser. No. 247,731
Int. Cl.³ G01N *1/10*; A01K *73/04*
U.S. Cl. 73—863.23 **4 Claims**



1. An underwater aquatic specimen retrieval device connectable to a towing cable by at least one release means connected to said towing cable, comprising:

sampling means for positioning on opposite sides of the towing cable to prevent interference, said sampling means including at least two sampling nets each having an open end and a closed end, at least two open frame members, towing means, a first connecting means, a second connecting means a third connecting means;

said open frame member each connected to said open end of one of said sampling nets, and said open frame members movably connected to said towing means, said towing means connectable to the towing cable to position said open frame members on opposite sides of the towing cable and positionable in a first pre-sampling closed position preventing samples from collecting in said sampling nets and in a second open position holding said frame members in a plane generally transverse to said towing cable for collecting samples in said sampling nets;

first connecting means for releasably connecting said sampling means to said release means and said towing cable;

second connecting means for releasably connecting said sampling means to said release means and said towing cable;

third connecting means for connecting said sampling means to said towing cable;

said sampling means having said first pre-sampling closed position, said second open position and a third post-sampling closed position;

said sampling means in said first pre-sampling closed position with said open frame members positioned to prevent sampling, when said first connecting means is connected to said release means, said second connecting means is connected to said release means and said third connecting means is connected to said towing cable;

said sampling means in said second open position, allowing sampling, when said first connecting means is disconnected from said release means, said second connecting

means is connected to said release means, and said third connecting means is connected to said towing cable;

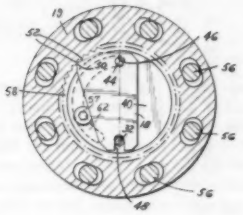
said sampling means in said third post-sampling closed position, preventing further sampling and preventing escape of samples, when said first and second connecting means are disconnected from said release means and said third connecting means is connected to said towing cable.

4,446,750

ESCAPEMENT DEVICE

Paul H. Stahlhuth, Mission Viejo, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Dec. 16, 1981, Ser. No. 331,110
Int. Cl.³ F16H *27/04*; G04B *15/00*
U.S. Cl. 74—1.5 **8 Claims**



1. An escapement device comprising:

a rotatable input member;

a rotatable output member;

means for urging said output member to rotate in one direction;

a pivotable intermediate member having a first pivotable connection to said input member offset from the axes of rotation of said input and output members and a second pivotable connection to said output member offset from the axis of rotation of said first pivotable connection and the axes of rotation of said input and output members;

a stop means engageable by said intermediate member when said intermediate member is in a first relative position with said input and output members for stopping said output member from rotation urged by said urging means; and

said intermediate member pivotable to a second relative position with respect to said input and output members upon rotation of said input member a predetermined amount such that said intermediate member disengages from said stop means to allow said output member to rotate in said one direction and said intermediate member pivots back to its first relative position upon rotation of said output member a predetermined amount to reengage said stop means.

4,446,751

KILN FLOOR SYSTEM

Norman H. Andreasen, 1520 Norwood Ave., Itasca, Ill. 60143

Division of Ser. No. 235,656, Feb. 18, 1981. This application Dec. 1, 1982, Ser. No. 445,918
Int. Cl.³ F16H *1/04, 35/06*; B61C *13/00*
U.S. Cl. 74—422 **5 Claims**

1. In a gear rack system for engaging at least one pinion of a turning machine associated with a kiln floor comprising

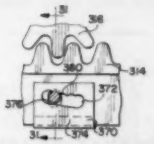
a plurality of gear rack sections adapted to be coupled to an adjoining wall above the kiln floor,

attachment means coupled to said gear rack for support thereof on the adjoining wall, said attachment means including a wear bar,

adjustment means attached to said wear bar to permit selected vertical movement of said gear rack sections relative to each other,

said adjustment means having a respective camming member affixed to the bottom portion of each of said gear sections,

a sloped slot formed in each of said camming members, a corresponding opening in said gear rack being alignable with said sloped slot, elongated members extending through said sloped slots and said openings for attachment to said wear bar, and



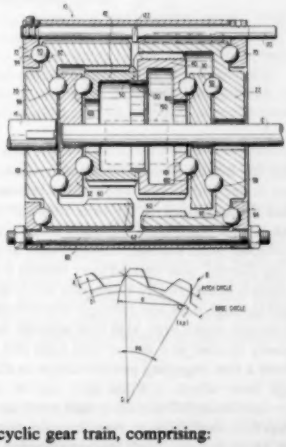
said elongated members having means to affix each of said gear sections in a fixed position and to release each gear section independently for adjustment of each gear section relative to the other.

4,446,752

EPICYCLOIDAL GEARS AND GEAR TOOTH ARRANGEMENT THEREFOR

James E. Shaffer, Longmont, and Robert G. Distin, Jr., Louisville, both of Colo., assignors to Advanced Energy Concepts '81, Ltd., Boulder, Colo.

Filed Apr. 23, 1981, Ser. No. 256,286
Int. Cl.³ F16H *55/06*
U.S. Cl. 74—462 **3 Claims**



1. An epicyclic gear train, comprising:

input and output means;

first and second orbiting gears;

first and second eccentric members coupled to said input for orbitally driving said orbiting gears;

first and second outer gears meshingly engaged with said first and second orbiting gears, respectively;

means for selectively braking either of said outer gears;

means for counterbalancing imbalance forces caused by said orbiting gears; and bearing means for supporting said orbiting gears for orbiting and rotating motion, said bearing means including first races formed in confronting axial surfaces of said first orbiting gear and said first eccentric member as well as in confronting axial surfaces of said second orbiting gear and said second eccentric member, respectively, and rollers guided in said first races; and

wherein said first orbiting gear and said first outer gear mesh with teeth having circular arc profiles and having a pres-

sure angle of 30°±7° in dependence upon the number of teeth difference between said first orbiting gear and said first outer gear, the number of teeth on said first orbiting gear being less than that on said first outer gear by a number of between two and eight.

4,446,753

ADJUSTABLE LENGTH CRANK ARM FOR A BICYCLE

Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Sep. 16, 1982, Ser. No. 418,630
Claims priority, application Japan, Sep. 24, 1981, 56-141756[U]
Int. Cl.³ G05G 1/14
U.S. Cl. 74—594.1 6 Claims

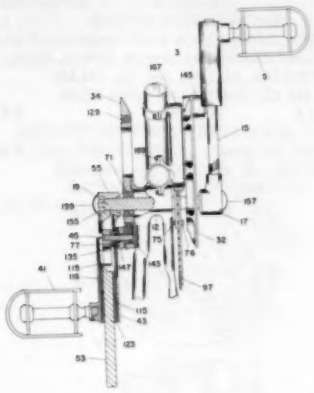
1. A crank for a bicycle comprising a crank arm having a through bore at one end thereof and annular recesses in continuation of said through bore on opposite first and second sides of said crank arm, a pedal shaft having a screw threaded portion, a first adapter fitted into said through bore at a pedal shaft mounting side thereof, said first adapter having a first mounting bore which is eccentrically positioned with respect to the center of said through bore and through which said pedal shaft is mounted to said crank arm, said first adapter having at the outer periphery thereof at a side of one axial end of said first mounting bore a first engaging portion larger in diameter than said through bore which is fitted into one of said annular recesses provided at said first side of said crank arm, a second adapter fitted into said through bore on said crank arm at a reverse side to said pedal shaft mounting side, said second adapter having a second mounting bore eccentrically positioned with respect to the center of said through bore and aligned with said first mounting bore, and having at the outer periphery at a side of one axial end of said second mounting bore a second engaging portion larger in diameter than said through bore which is fitted into one of said annular recesses provided at said second side of said crank arm, at least one of said first and second mounting bores at said first and second adapters having a screw threaded portion which is screwable with said screw threaded portion of said pedal shaft, an anti-rotation mechanism comprising a plurality of engaging splines extending axially of said through bore and provided between at least one of said first and second adapters and said crank arm which restrains said adapters from rotating with respect to said crank arm, and a connecting means for connecting and drawing said first and second adapters toward each other.

4,446,754

PEDAL TELESCOPING DEVICE

Jesse R. Chattin, 7201 S. 49th Ave., Tampa, Fla. 33600

Continuation of Ser. No. 100,625, Dec. 5, 1979, abandoned, which is a continuation-in-part of Ser. No. 901,363, Apr. 28, 1978, abandoned. This application Feb. 19, 1982, Ser. No. 350,262
Int. Cl.³ G05G 1/14
U.S. Cl. 74—594.3 15 Claims



1. An apparatus for telescoping a pedal of a pedal assembly between a retracted and extended position during rotation of the pedal, said apparatus comprising a spindle housing having an axle shaft rotatably disposed therein, a first cam plate mounted on said axle shaft such that said first cam plate is stationary relative to said spindle housing, a first cam ring radially spaced from said first cam plate by a ring bearing disposed circumferentially therebetween, a pedal arm attached to said axle shaft, a pedal guide slidably mounted rectilinearly on said pedal arm and having a lead bolt means attached thereto, the pedal being attached to said pedal guide and a drive means interconnected to said axle shaft to rotate with said axle shaft, said lead bolt means being rotatably coupled to said first cam ring to interconnect said pedal guide to the periphery of said first cam ring such that said lead bolt means and said pedal guide rotate together with said first cam ring about said first cam plate, said lead bolt means being rotatably movable relative to said first cam ring wherein said first cam ring controls the movement of said lead bolt means to move said pedal guide between said retracted and extended position as said pedal arm and said pedal guide rotate with said axle shaft.

4,446,755

AIR BREATHER DEVICE OF AN AUTOMOTIVE MANUAL TRANSMISSION

Kotei Takahashi, Yokohama, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

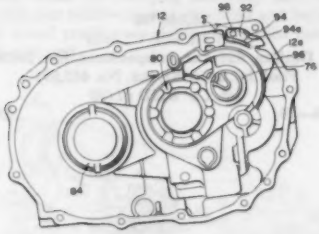
Filed Feb. 19, 1982, Ser. No. 350,390
Claims priority, application Japan, Feb. 20, 1981, 56-22889
Int. Cl.³ F16H 57/02
U.S. Cl. 74—606 R 5 Claims

1. In a transmission including a transmission housing and a clutch cover which are coupled with each other by sealingly contacting their respective mating flange portions, an air breather device comprising:

a first rib integrally formed on said transmission housing to form in the vicinity of the mating flange portion of the transmission housing a first recess which faces toward said clutch cover;

a second rib integrally formed on said clutch cover to form in the vicinity of the mating flange portion of the clutch

cover a second recess which faces toward said transmission housing, said first and second ribs being sealingly contacted at their tops with each other to merge said first and second recesses thereby to form a chamber upon coupling said transmission housing and said clutch cover;



first means defining in said first and second ribs respective cuts which constitute, upon coupling said transmission housing and said clutch cover, independent openings through which the interior of said chamber is communicated with the interior of said transmission housing; and

second means communicating the interior of said chamber with the outside of said transmission housing.

4,446,756

POWER DIVIDER GEARBOX WITH A PLANETARY DIFFERENTIAL GEAR DRIVE

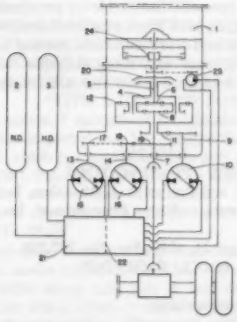
Faust Hagin, and Hans J. Drewitz, both of Munich, Fed. Rep. of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 10, 1980, Ser. No. 215,146

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1979, 2950619

Int. Cl.³ F16H *47/04, 37/06*

U.S. Cl. 74—687 **6 Claims**



1. In a power divider gearbox having an input shaft and an output shaft and including a planetary differential gear drive comprising dual planetary pinions, two sun gears having different diameters and an internal ring gear meshing with said pinions, said planetary differential gear drive dividing the power transmitted to the power divider gearbox through the input shaft into a mechanical branch and a hydraulic branch, said hydraulic branch being connected to the internal ring gear; the improvement comprising: a first of said sun gears having a large diameter and being torsionally rigidly connected with the gearbox output shaft, and the second of said sun gears having a small diameter and being connected to the gearbox input shaft.

4,446,757

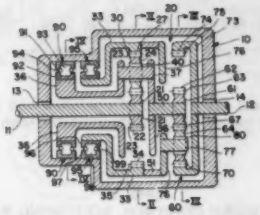
DIRECTIONAL GEAR RATIO TRANSMISSIONS

Alan E. La Fever, La Habra Heights, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 11, 1982, Ser. No. 387,728

Int. Cl.³ F16H *57/10, 3/44, 5/52*

U.S. Cl. 74—758 **15 Claims**



1. A directional gear ratio transmission comprising:

transmission housing means;

first shaft means;

second shaft means;

first epicyclic assembly means for receiving input from said first shaft means in a first or a second direction with respect to said transmission housing means;

first and second output means, within said first epicyclic assembly means, for transmitting output from said first epicyclic assembly means;

first means for restricting transmission of said output from said first output means in said first direction;

second means for restricting transmission of said output from said second output means in said first direction;

second epicyclic assembly means for transmitting output to said second shaft means in said first or said second direction;

first and second input means, within said second epicyclic assembly means, for receiving said output from said first and said second output means;

first connecting means for transmitting said output from said first output means to said first input means;

second connecting means for transmitting said output from said second output means to said second input means;

said input from said first shaft means is transmitted by said directional gear ratio transmission to said second shaft means at a higher speed and lower gear ratio when said input is in said first direction than in said second direction.

4,446,758

PLANETARY TRANSMISSION

James E. Winzeler, East Peoria, and Willis E. Windish, Pekin, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US81/00917, 371 Date Jul. 7, 1981, 102(e) Date Jul. 7, 1981, PCT Pub. No. WO83/00200, PCT Pub. Date Jan. 20, 1983

PCT Filed Jul. 7, 1981, Ser. No. 288,951

Int. Cl.³ F16H *3/44, 57/10, 37/00*

U.S. Cl. 74—781 R **8 Claims**

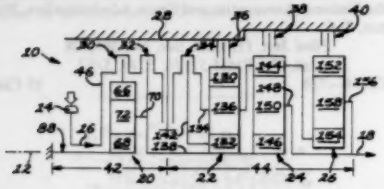
1. A planetary transmission (10) comprising:

a front section (42) having a rotating housing (46) and a planetary gear set (20) including a sun gear (68), a planet carrier (70) and a ring gear (66), the rotating housing (46) serving as the input and the planet carrier (70) serving as the output;

holding means (88) for holding the sun gear (68) stationary;

first clutch means (30) for selectively connecting the ring gear (66) to the rotating housing (46) and providing an underdrive mode of operation and including an actuating piston (110) jointly rotatable with the housing (46); and

second clutch means (32) for selectively connecting the planet carrier (70) to the rotating housing (46) and providing a direct drive mode of operation and including an actuating piston (110) jointly rotatable with the housing (46).

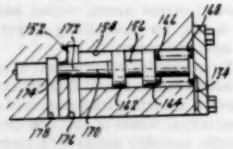


4,446,759

CLUTCH STROKE CONTROL METERING VALVE FOR AN AUTOMATIC TRANSMISSION

Paul T. McCrary, Ypsilanti, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 2, 1981, Ser. No. 307,990
Int. Cl.³ F16H *47/00*; B60K *41/06, 41/08*
U.S. Cl. 74—867 **3 Claims**



1. In an automatic transmission for use in a vehicle driveline having an internal combustion engine and multiple ratio gearing establishing plural torque delivery paths between the engine and vehicle traction wheels:

fluid pressure operated servos including a brake servo and a clutch servo for effecting speed ratio changes by controlling the relative motion of the elements of the gearing;

said clutch servo being applied during high speed ratio operation and released during intermediate speed ratio operation and said brake servo being released during high speed ratio operation and applied during intermediate speed ratio operation;

said brake servo having a pressure movable piston with two pressure chambers, one on each side thereof, the effective pressure area on the release side of the piston being greater than the effective pressure area on the apply side thereof so that the piston assumes a brake release position when both chambers are pressurized;

shift valve means for selectively distributing and exhausting pressure from said pressure chambers;

a source of an engine torque signal and a source of a speed signal proportional to the driven speed of said vehicle communicating with said shift valve means for actuating the same;

an accumulator timing valve in fluid communication with the release side of said brake servo comprising a valve chamber and a movable valve spool therein;

a flow metering orifice in said valve chamber;

said movable valve spool having a metering stem thereon registering with said orifice and adapted to move relative to said orifice to decrease the effective flow area of said orifice upon movement thereof in one direction and effective to increase the effective flow area of said orifice upon movement thereof in the opposite direction;

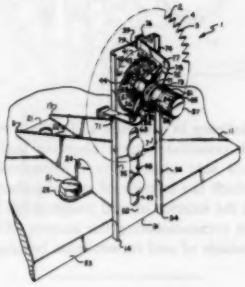
said timing valve being in fluid communication with said governor the latter effecting a pressure force on the former to shift said spool toward a said one direction thereby delaying the application of said brake upon a ratio change from the high speed ratio to an intermediate speed ratio, the magnitude of the delay being dependent upon said driven speed.

4,446,760

SAW BLADE CLAMP

Daniel W. Denham, 806 Ann, Independence, Mo. 64056

Filed Jul. 28, 1982, Ser. No. 402,591
Int. Cl.³ B23D *61/10*
U.S. Cl. 76—79 **19 Claims**



1. A clamp for releasably securing a saw blade having a generally circular configuration with a central opening to a support having an opening, which comprises:

(a) a lever having a distal end adapted for clamping said saw blade to said support and a proximate end;

(b) lever mounting means comprising a spindle adapted for extending through said saw blade and support openings, said spindle being adapted for attachment to said support and pivotally connected to said lever at a fulcrum between said proximate and distal ends of said lever; and

(c) biasing means connected to said lever proximate end and adapted for urging said lever proximate end away from said support and said lever distal end toward said blade;

(d) said lever proximate end being movable toward said blade whereby said lever distal end is disengaged therefrom.

4,446,761

PIPE SPINNING TOOL

George I Boyadjieff, and Frederick A. Monahan, both of Anaheim, Calif., assignors to Varco International, Inc., Orange, Calif.

Filed Apr. 24, 1981, Ser. No. 257,105
Int. Cl.³ B25B *17/00*
U.S. Cl. 81—57.19 **15 Claims**

1. A pipe spinner comprising:

a plurality of rollers engageable with a pipe at different locations about its periphery and adapted to grip and spin the pipe;

two body parts having portions receivable at different sides respectively of said pipe and each carrying at least one of said rollers;

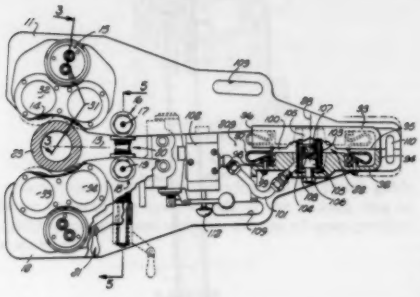
two structures movably mounting said body parts respectively;

to pivotal connections attaching said body parts to said structures respectively for pivotal movement of the body parts relative to said structures about two spaced axes between a closed position in which the rollers grip and drive a pipe and an open position releasing the pipe;

a rotatable adjusting element having a right hand thread and a left hand thread;

right hand and left hand threads on said two structures respectively engaging said right hand and left hand threads of said adjusting element in a relation moving said structures and the axes of said pivotal connections toward and away from one another in response to rotation of said adjusting element, to grip and drive different sizes of pipe;

powered means for swinging said body parts about said pivotal axes relative to said structures and between open and closed positions in differently spaced conditions of said axes; and



motor means operable to drive at least one of said rollers rotatively, and thereby turn the pipe, in any of a plurality of different rotary settings of said adjusting element in which said pivotal axes of the body parts are spaced different distances apart;

said powered means including a unit which is operable by pressurized fluid and which, in any of a plurality of differently spaced conditions of said axes, acts to urge two actuating portions of said body parts relatively apart and thereby pivot said first mentioned portions of the body parts and their carried rollers toward one another and against the pipe.

4,446,762

UNIVERSALLY USABLE HYDRAULIC WRENCH FOR SIMULTANEOUSLY TIGHTENING OR LOOSENING TWO THREADED CONNECTORS OR FOR TIGHTENING OR LOOSENING A SINGLE THREADED CONNECTOR WITH A GREATER FORCE

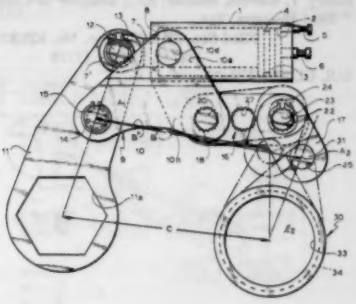
John K. Junkers, 7 Arrowhead La., Saddle River, N.J. 07458

Continuation-in-part of Ser. No. 315,998, Oct. 28, 1981, Pat. No. 4,406,185, which is a continuation-in-part of Ser. No. 265,234, May 19, 1981, Pat. No. 4,387,611. This application Aug. 5, 1983, Ser. No. 521,161

Int. Cl.³ B25B *13/00*

U.S. Cl. 81—57.39 **9 Claims**

1. A hydraulic wrench comprising fluid-operated cylinder and piston means including a cylinder having an axis, a piston reciprocatable along said axis in said cylinder between an active stroke and a return stroke; connecting means connected to and projecting from one side of said cylinder; elongated drive lever means provided in the region of one end thereof with means for drivingly engaging a polygonal member of a first threaded connector to be turned during the active stroke of said piston; first mounting means for mounting said drive lever means intermediate its ends on said connecting means for tilting movement about a first pivot axis with the other end of said drive lever means operatively connected to said piston; elongated drive link means provided in the region of one end for drivingly engaging a polygonal member of a second threaded connector to be turned during the active stroke of said piston; elongated anchoring link means provided in the region of one end for engaging a polygonal member of a second threaded connector adjacent said first threaded connector; and second mounting means for releasably connecting the other end of either said drive link means or said anchoring link means to said connecting means for tilting movement about a second pivot axis parallel to and transversely spaced from said first pivot axis, whereby when the drive link means is connected to said connecting means two threaded connectors may



be turned simultaneously during the active stroke of said piston, while when said anchoring link means is connected to said connecting means the full force of said cylinder-and-piston means may be used to drive only said first threaded connector while said anchoring link means transmits the reaction force created during such turning to said second threaded connector.

4,446,763

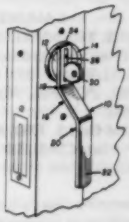
MORTICE CYLINDER LOCK WRENCH STRUCTURES

LeVone A. Blough, 95 Horseshoe Dr., Longwood, Fla. 32779, and David L. Gregory, 10207 Union Park Dr., Orlando, Fla. 32817

Continuation-in-part of Ser. No. 146,213, May 5, 1980, abandoned. This application Jan. 7, 1982, Ser. No. 337,839

Int. Cl.³ B25B *13/02*

U.S. Cl. 81—90 B **7 Claims**



1. A wrench apparatus for removal of a cylinder of a mortice or similar lock from a structure in which the lock is installed, the lock being operable by a key or thumbturn, comprising wrench means for rotating the lock to remove the lock from the structure, the wrench means comprising:

an annular body member having an inner annular surface at least a portion of which engages at least a portion of outer edge surfaces of the lock cylinder, the engagement providing load-bearing contact therebetween on rotation of the wrench means; and,

a body portion extending substantially diametrically across the annular body member and being attached thereto, the body portion having a longitudinal slot to receive the key or thumbturn associated with the lock, the slot extending diametrically across the annular body member with a portion of the slot lying over the center of the circle defined by the annular body member, inner edge surfaces of the slot bearing against the key or thumbturn to provide

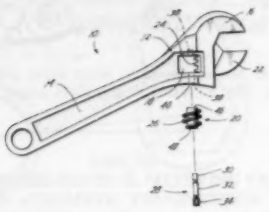
load-bearing contact therebetween on rotation of the wrench means.

4,446,764

ADJUSTABLE WRENCH ADJUSTING MECHANISM

Henry T. Sievers, Sumter, S.C., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Sep. 30, 1982, Ser. No. 429,876
Int. Cl.³ B25B *13/16*
U.S. Cl. 81—170 8 Claims



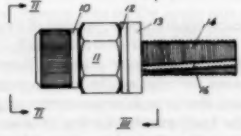
1. An adjustable wrench comprising:
(a) a main body section having a handle and a fixed jaw formed therewith;
(b) a movable jaw slidably mounted with said main body section;
(c) a rotatable adjustment sleeve having external threads thereon adapted to cooperate with teeth on said movable jaw to cause said movable jaw to open and close relative to said fixed jaw; and
(d) pin means for rotably mounting said adjustment sleeve with said main body section, said pin means including shear means for permitting ready shearing of said pin means in order to easily remove said adjustment sleeve from said wrench main body section.

4,446,765

TORQUE TRANSMITTING DEVICE

Daryl Wheeler, 4 Hope Rd., Ardross, Australia (6153)

PCT No. PCT/AU81/00142, 371 Date Jun. 4, 1982, 102(e) Date Jun. 4, 1982, PCT Pub. No. WO82/01150, PCT Pub. Date Apr. 15, 1982
PCT Filed Oct. 2, 1981, Ser. No. 387,878
Int. Cl.³ B25B *15/00*
U.S. Cl. 81—441 16 Claims



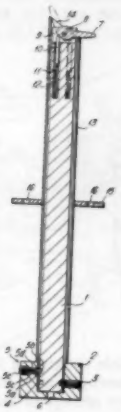
1. A torque transmitting device characterised by a shaft having a longitudinal axis and a first end and a second end said first end being arranged to be inserted foremost into a bore in a workpiece, wherein the shaft is formed with at least one groove extending longitudinally of the shaft, a workpiece engaging jaw is mounted in the or each groove, means is provided for retaining the or each jaw in its respective groove and wherein the or each groove is tilted with respect to the longitudinal axis of the shaft so that the or each jaw is non-aligned with the longitudinal axis of the shaft.

4,446,766

BLADED ROTOR TURNING APPARATUS

Desmond C. Lucey, Charfield, near Bristol, England, assignor to Rolls-Royce Limited, London, England

Filed Jun. 2, 1981, Ser. No. 269,610
Claims priority, application United Kingdom, Jun. 19, 1980, 8020134
Int. Cl.³ B25B *23/142*
U.S. Cl. 81—480 9 Claims



1. An apparatus for turning a bladed rotor of a machine comprising:
a rotatable shaft;
at least one finger secured to one end of said shaft, said finger being rotatable with said shaft about an axis extending along the longitudinal length of said shaft and being engagable with a blade of a rotor to rotate the rotor when the shaft is rotated, said finger being articulated on the shaft about an axis substantially perpendicular to the axis of the shaft; and
an inclining means cooperating with the finger to incline said finger with respect to the longitudinal axis of the shaft in dependence upon the rotational position of said shaft, said inclining means being arranged to incline the finger so that a longitudinal axis of the finger is substantially perpendicular to the shaft axis at one rotational position of the shaft and is substantially parallel to the shaft axis at a substantially diametrically opposed position of the shaft.

4,446,767

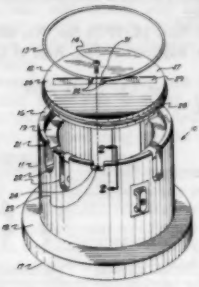
LOCKING RING STRIPPER PLATE ASSEMBLY

Kenneth J. Wilson, Roseville, Minn., assignor to Wilson Tool Company, White Bear Lake, Minn.

Filed Nov. 30, 1981, Ser. No. 325,650
Int. Cl.³ B26D *7/18*; B21D *45/08*
U.S. Cl. 83—136 7 Claims

1. An improved stripper plate assembly for use with a punch guide assembly and comprising
(a) A punch guide sleeve having a stripper plate-receiving end, the latter having a stripper plate support shoulder formed annularly within said sleeve and a groove formed annularly within said sleeve adjacent but spaced from said stripper plate support shoulder;
(b) a stripper plate carried within the stripper plate receiving end of the punch guide sleeve and having a peripheral flange disposed between the annularly groove and the annular support shoulder and engaging the annular support shoulder;
(c) a split locking ring of circular cross-section seated in the groove and bearing against the peripheral flange of the

stripper plate to lock the latter into position against the annular support shoulder, the split locking ring having adjacent, spaced ends; and



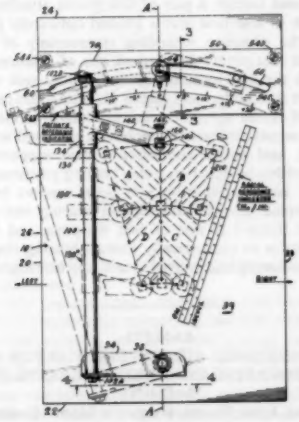
(d) removeable spacer means threaded into the punch guide sleeve between the spaced ends of the locking ring to rigidly space apart and maintain the spaced-apart position of such ends.

4,446,768

GLASS CUTTER DEVICE

John J. Sirmans, 300 Allen St., Walbridge, Ohio 43465

Filed May 11, 1981, Ser. No. 262,549
Int. Cl.³ C03B *33/04*; B26D *3/08*
U.S. Cl. 83—879 **1 Claim**



1. A device for facilitating the cutting of glass into similar shapes and sizes comprising:

(a) a base member having an upper surface;

(b) a member having an arcuately shaped slot affixed to the upper surface of the base member;

(c) a first longitudinally extending member having a first end and a second end, said first end being pivotally mounted to the upper surface of one portion of said base member;

(d) a second longitudinally extending member having a first end and a second end, with a portion of said second longitudinally extending member being engaged for free sliding movement in the arcuate slot;

(e) a third longitudinally extending member rigidly connecting said first and second longitudinally extending members;

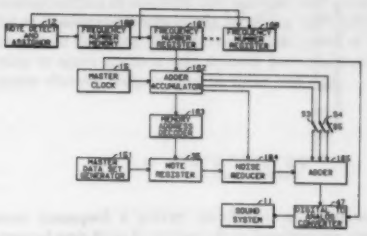
(f) slidable means on the third longitudinally extending member for holding a tool therein for cutting purposes.

4,446,769

COMBINATION TONE GENERATOR FOR A MUSICAL INSTRUMENT

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Jul. 14, 1982, Ser. No. 398,044
Int. Cl.³ G10H *1/06, 5/00*
U.S. Cl. 84—1.01 **11 Claims**



8. In a musical instrument having a plurality of tone generators which are assigned to actuated keyswitches contained in a keyboard array of keyswitches, apparatus for generating musical tones comprising a sawtooth waveform with selectable octave pitches determined by a preselected pitch control signal comprising;

a note detection means repetitively scanning said keyboard array of keyswitches and wherein a new note signal is created in response to each keyswitch status change from a nonactuated state to an actuated state,

a frequency number generator means wherein a frequency number is generated in response to said new note signal,

a plurality of frequency number memories,

an assignor means responsive to said new signal whereby said frequency number generated by said frequency number generator means is stored in a corresponding one of said plurality of frequency number generators,

a plurality of adder-accumulator means each of which is associated with a corresponding one of said plurality of frequency number memories, and each of which successively adds said frequency number stored in said corresponding frequency number memory to the contents of an accumulator to form a waveshape data word comprising a sequence of binary digital bits,

a plurality of data selectors, each of which is associated with one of said plurality of adder-accumulator means, whereby a subsequence of said sequence of binary digital bits is selected in response to said preselected pitch control signal, and

conversion means whereby said selected subsequence of binary digital bits is converted to produce a musical tone.

4,446,770

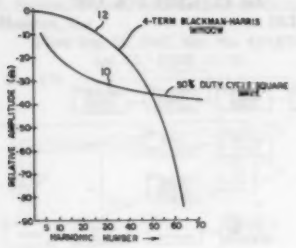
DIGITAL TONE GENERATION SYSTEM UTILIZING FIXED DURATION TIME FUNCTIONS

Steven C. Bass, Stockwell, Ind., assignor to Kimball International, Inc., Jasper, Ind.

Continuation of Ser. No. 190,631, Sep. 25, 1980, Pat. No. 4,351,219. This application Aug. 27, 1982, Ser. No. 412,258
The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclaimed.
Int. Cl.³ G01H *1/057, 1/06*
U.S. Cl. 84—1.01 **16 Claims**

1. An electronic musical instrument comprising: player actuated tone frequency selection means, memory means for storing one cycle of a fixed width window function waveform, means responsive to the actuation of the tone selection means for reading said waveform out of said memory at a fixed rate for each cycle thereof independent of the frequency selected and in a repetitive fashion to produce a continuous signal

wherein the period of dead time between each successive reading of a cycle of the waveform is selectively adjusted in response to the frequency selected by the tone selection means without changing the width of the read out waveform to thereby produce a continuous train of time sequential said



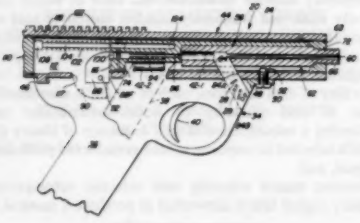
window function waveforms having a frequency inversely inversely proportional to the period of dead time between the commencement of each successive reading, and means responsive to the train of read out waveforms for producing an audible musical tone.

4,446,771

PROJECTILE FIRING WEAPON WITH WAD DISCHARGE PORT

Myron L. Anthony, and Shane D. L. Anthony, both of 607 Agana Dr., Grand Junction, Colo. 81501

Filed Aug. 7, 1981, Ser. No. 291,021
Int. Cl.³ F41C 5/06; F42B 13/16
U.S. Cl. 89—14 SB **7 Claims**



1. In a magazine-fed firearm having a receiver supported on a frame, a barrel fixed to the receiver and presenting a firing chamber at the breech for receiving a cartridge, and a recoil-operated spring-returned bolt supporting a firing pin, the improvements for firing a cartridge in which a gas-impervious piston is packed between the charge and the projectile, the cartridge casing being of considerably larger caliber than the projectile and the piston having the internal diameter of the casing so as to apply a concentrated driving force to the rear of the projectile upon discharge, which improvements comprise:

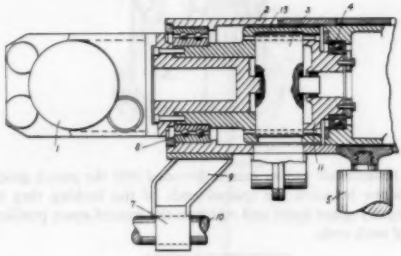
a discharge port adjacent the breech of the barrel between the firing chamber and the bore of the barrel and having a long dimension parallel to the bore axis less than the length of the projectile so that on discharge of the cartridge the projectile temporarily spans said port as it attains the barrel bore while being driven by the piston, said port constituting a discharge for the piston.

4,446,772

LARGE-BORE TWIN-WEAPON SYSTEM FOR COMBAT VEHICLES

Manfred Eggers, and Armin Zonak, both of Kiel, Fed. Rep. of Germany, assignors to MaK Maschinenbau GmbH, Kiel, Fed. Rep. of Germany

Filed Nov. 14, 1977, Ser. No. 851,265
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1976, 2651679
Int. Cl.² F41H 7/00
U.S. Cl. 89—37 E **5 Claims**



1. A system for mounting weapons on a combat vehicle with the weapons arranged to extend along the long sides of the vehicle, comprising a horizontal axially extending carrier arranged to extend transversely of the long sides of the combat vehicle, a pair of large-bore weapons each mounted on said carrier spaced from one another and extending transversely of the axis of said carrier, a pair of first pivots attached to said carrier, each of said first pivots located outwardly from said carrier in the direction extending transversely of the axis thereof, said first pivots defining an axis of rotation for said carrier with the axis located outwardly from said carrier, a second pivot attached to said carrier for lifting said carrier and pivoting said carrier around the axis of rotation formed by said first pivots, means for rotatably mounting each said weapon on said carrier, said means comprises a main support bearing positioned within said carrier, a step bearing positioned within said carrier and spaced from said main support bearing, a journal mounted in said main support bearing and said step bearing and flanged to one of said weapons, and said step bearing includes an eccentrically formed bearing ring for eccentrically adjusting said journal in said step bearing relative to said carrier.

4,446,773

COMPRESSED AIR DISTRIBUTOR FOR A RECIPROCATING CONCRETE BREAKING TYPE MACHINE

Henri Emonet, Loire, France, assignor to Maco-Meuden, France

Continuation of Ser. No. 207,823, Nov. 7, 1980, abandoned, which is a continuation of Ser. No. 943,724, Sep. 19, 1978, abandoned. This application Aug. 10, 1982, Ser. No. 406,815
Int. Cl.³ F01L 25/04
U.S. Cl. 91—317 **1 Claim**

1. In combination with a reciprocating compressed air jack-hammer machine, for breaking concrete, of the type having a housing including a portion defining a central passage with one end and an opposite end, a tool mounted in the opposite end of said central passage and a piston disposed adjacent said tool; said jack-hammer machine further having a compressed air distribution system including an inlet chamber and passage means for ducting the compressed air alternatively to the front of said piston and to the back of the piston to reciprocate said piston in said central passage in said housing, said piston further striking said tool when the compressed air is ducted to reciprocate said piston toward said tool, the improvement comprising:

a distributor body mounted adjacent to said one end of said central passage of said housing, said distributor body further comprising:

a front seat member having a first contact surface and portions defining a central hole formed in said first contact surface, said central hole further being connected to said central passage for flow communication therebetween, said front seat member formed of shock resistant plastic;

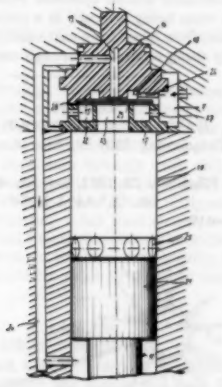
a back seat member mounted adjacent to said front seat member, said back seat member having a second contact surface adjacent to said first contact surface, said back seat member being formed of shock resistant plastic;

a circular solid pellet member mounted for oscillation between said first contact surface of said front seat member and said second contact surface of said back seat member, said circular solid pellet member defining a low inertia disk with a thickness 1.2 mm or less, said circular solid pellet member further defining a first chamber on one side of said circular solid pellet member and a second chamber on the opposite side of said circular solid pellet member, said first chamber being in fluid communication with said central hole when said circular solid pellet member is contiguous to said second contact surface and spaced away from said first contact surface; and

first inlet passage means, disposed in said front seat member for selectively connecting said inlet chamber to said central passage, said first inlet passage means further comprising at least one inlet hole spaced a predetermined distance from said first contact surface, said at least one inlet hole connecting said inlet chamber with said first chamber for fluid communication therebetween and thereby selectively interconnecting said first inlet passage means with said central passage when said circular solid pellet member is contiguous with said second contact surface of said back seat member; said communication between said inlet chamber and said central passage being terminated when said circular solid pellet member is contiguous said first contact surface of said front seat member;

second inlet passage means, disposed in said back seat member, for connecting said second chamber with said inlet chamber and said central passage when said circular solid pellet member is contiguous to said first contact surface and spaced away from said second contact surface; and

exhaust passage means located in said central passage of said housing in spaced relationship to said distributor body such that compressed air entering said inlet chamber is communicated through said first inlet passage means to said first chamber and to said central passage to move said circular solid pellet member towards said second contact surface of said back seat member and to further move said piston from a predetermined point in a front direction uncovering said exhaust passage means, said compressed air simultaneously being communicated through said second inlet passage means to said second chamber and to said central passage to the front of said piston such that when said piston uncovers said exhaust passage means and said circular solid pellet member moves against said first contact surface of said front seat member, said compressed air at the front of said piston returning said piston in a backward direction to its predetermined point of beginning to again uncover said exhaust passage means, said piston thereby reciprocating to strike said tool.



4,446,774

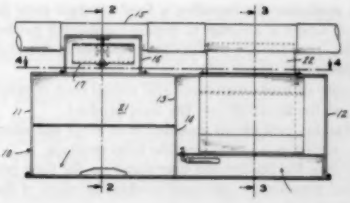
AIR CONDITIONING APPARATUS

Gershon Meckler, 7425 Democracy Blvd., Unit 212, Bethesda, Md. 20034

Continuation of Ser. No. 150,953, May 19, 1980, Pat. No. 4,315,412, which is a continuation of Ser. No. 897,271, Apr. 17, 1978, abandoned, which is a continuation of Ser. No. 735,548, Oct. 26, 1976, Pat. No. 4,084,389, which is a continuation of Ser. No. 572,792, Apr. 29, 1975, abandoned. This application Feb. 12, 1982, Ser. No. 348,408

Int. Cl.³ F24F *7/00, 13/00*

U.S. Cl. 98—38 D **65 Claims**



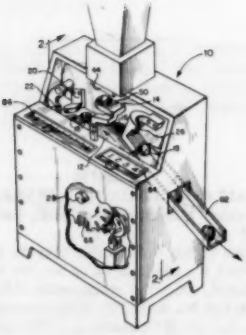
1. Apparatus for delivering air for air conditioning a zone of a building, said apparatus comprising, in combination, a mixing chamber having a first and a second air inlet, means for delivering primary, conditioned air through said first inlet to said chamber, means including an air bag actuator and effective to vary the rate at which primary conditioned air is delivered to said chamber between a maximum and a predetermined lesser rate, a fluidic valve having first and second discharge legs and operably connected to receive air circulated in the apparatus, means for conducting air between the first discharge leg of said fluidic valve and said air bag actuator, an outlet operatively connected to deliver air from said chamber to the zone of the building, and induction means operative to induce a flow of air into said chamber through said second inlet thereof for mixture therein with primary conditioned air and delivery therewith through said outlet to the building zone, whereby the energy required to power said means effective to vary the rate at which primary conditioned air is delivered to said chamber is provided by air circulated in the apparatus.

4,446,775

APPARATUS FOR HEATING FOOD PRODUCTS

Claude A. Reed, Omaha, Nebr., assignor to International Food Equipment, Inc., Peoria, Ill.

Continuation of Ser. No. 251,906, Apr. 7, 1981, abandoned, which is a division of Ser. No. 909,795, May 26, 1978, Pat. No. 4,261,258, which is a continuation of Ser. No. 719,585, Sep. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 446,951, Feb. 28, 1974, Pat. No. 3,996,847, which is a continuation-in-part of Ser. No. 190,254, Oct. 18, 1971, abandoned. This application Jan. 13, 1983, Ser. No. 457,530
The portion of the term of this patent subsequent to Apr. 14, 1998, has been disclaimed.
Int. Cl.³ A47J *37/12*
U.S. Cl. 99—353 16 Claims



1. An appliance for impaling a food product onto heating grills, and which is adapted to impale hamburger patties onto such grills, preparatory to a cooking operation, the combination comprising:

a plurality of heat conductive grill means each of which has an end for insertion into the food product,

said plurality grill means mounted in an array and adapted to be inserted as a group into the food product;

a first zone for performing operations on the food product;

a second zone for the principal cookig operation of the food product;

a container for a liquid cooking medium in said second zone;

means for heating the liquid cooking meidum;

means for moving said grill means so that said grill means will be located at said first and second zones;

said grill means constructed and arranged so as to project substantially upright with said ends positioned for supporting the food product on the top portion during at least a portion of the time said grill means is positioned in said first zone;

placer means for positioning the food product on said upright grill means in said first zone;

means for moving said placer means and said grill means relatively toward and away from each other so as to support the food product on said ends of said upright grill means;

means for moving said grill means and the food product relatively toward each other for impaling the food product onto said grill means; and

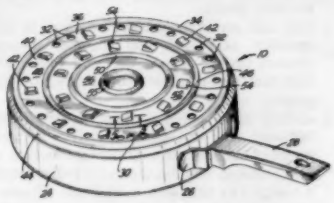
means for submerging the food product impaled on said grill means in said liquid cooking medium.

4,446,776

HEATING ACCESSORY

Stanley Gelfman, Riverdale, N.Y., assignor to Krischer Metal Products Co., Inc., Moonachie, N.J.

Filed Apr. 18, 1983, Ser. No. 485,957
Int. Cl.³ A47J *37/00*
U.S. Cl. 99—401 20 Claims



1. A food heating device adapted for positioning over and surrounding a heat source, the device comprising a substantially planar surface supported by supporting walls, the surface having a plurality of peripherally disposed apertures to provide passages for vertically rising air streams, and a formation of circumferentially spaced louvered vents, the openings of each of said vents being disposed in a circular pattern to produce a circular flow of air from said vents for interacting with the vertically rising airstreams through said apertures.

4,446,777

HAND-HELD BARBECUE SPIT

Donald C. Grigorenko, 3107 N. Star Ave., Columbus, Ohio 43212

Filed Sep. 28, 1982, Ser. No. 425,189
Int. Cl.³ A47J *37/04*
U.S. Cl. 99—419 7 Claims

1. A hand-held barbecue spit comprising:

(a) an elongated, substantially rigid metallic frame provided at one end thereof with a handle-supporting terminal and at its opposite end with an annular, fork-supporting loop, said loop being formed with a plurality of relatively spaced apart fork-receiving openings;

(b) a handle carried by the handle-supporting terminal of said frame; and

(c) a plurality of generally U-shaped forks extending through said loop, demountably carried in the openings of said loop and formed with elongated, spit-like tines extending generally radially of said annular loop.

4,446,778

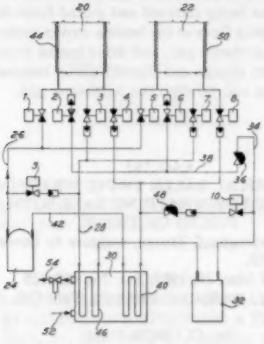
PASTEURIZATION SYSTEM WITH HEAT RECOVERY

Alberto Cipelletti, Guardamiglio, Italy, assignor to Frigomat S.a.s. di Alberto Cipelletti & C., Milan, Italy

Filed Sep. 9, 1982, Ser. No. 416,395
Claims priority, application Italy, Sep. 10, 1981, 23878 A/81
Int. Cl.³ A23C *3/04, 9/00*
U.S. Cl. 99—455 8 Claims

1. A pasteurization system comprising: a plurality of basins, with said system adapted for effecting in each basin a heating

of a product therein to a pasteurization temperature followed by a cooling to a preservation temperature, and arranged for conducting said heating and cooling sequentially from basin to basin whereby as heat is liberated from a basin undergoing cooling, said liberated heat is at least partially utilized to effect heating of another basin, and wherein said system for heating and cooling said plurality of basins comprises; a refrigeration circuit having a first part arranged downstream from a compressor for circulating hot fluid therethrough, a second part arranged downstream from an expansion valve for circulating



cooled fluid therethrough, heat exchanging means arranged connected between the ends of said first and second parts, a plurality of coils, corresponding to said plurality of basins, each arranged thermally connected with a respective basin and for effecting fluid circulation through each coil, and valve means arranged for selectively connecting each coil of each basin selectively to different parts of said refrigeration circuit to effect one of circulating a hot fluid stream therethrough, circulating a cold fluid stream therethrough, or circulating no fluid stream therethrough, whereby both heating and cooling of each basin is effected by means of the same coil.

4,446,779

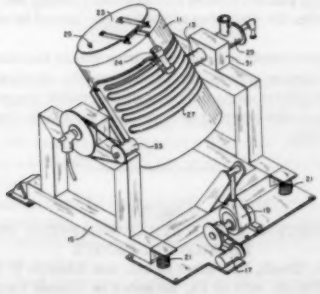
MEAT PROCESSOR

Raymond W. Hubbard, 1746 W. Longview Ave., Stockton, Calif. 95201; John B. Seiffhart, 867 Kramer Dr., Lodi, Calif. 95240, and Thomas Hubbard, 3461 W. Michigan, Stockton, Calif. 95204

Continuation of Ser. No. 213,555, Dec. 5, 1980, abandoned. This application Apr. 8, 1983, Ser. No. 482,270

Int. Cl.³ A23B *4/00, 4/02, 4/14*

U.S. Cl. 99—472 **14 Claims**



1. A meat processor comprising

a drum relatively smooth walled interior cavity having an internal vertical cross-section disposed parallel to the longitudinal axis of said drum which, when said drum is rotated about an axis perpendicular to the plane of said cross-section, causes the meat disposed in said drum to tumble and slide from end to end in said drum, and

means for shaking said drum up and down with a preferred variable rate in the plane of said cross-section with a preferred predeterminable variable positive vertical displacement of the drum irrespective of the rate of rotation of the drum or the weight of meat being processed in the drum.

4,446,780

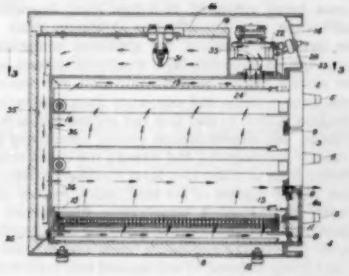
FOOD HOLDING CABINET WITH STABILIZED AIR FLOW

Timothy J. Puvogel, West Alexandria; James D. King, Oakwood, and David O. Moore, Eaton, all of Ohio, assignors to Henny Penny Corporation, Eaton, Ohio

Filed Aug. 26, 1982, Ser. No. 412,027

Int. Cl.³ F26B *9/06*

U.S. Cl. 99—480 **9 Claims**



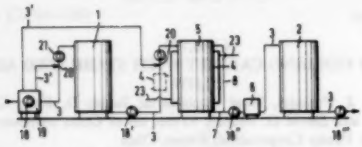
1. A heating and air circulating system for a holding cabinet having a normally closed product receiving compartment containing a plurality of product receiving receptacles lying one above the other, said system having a blower unit overlying said product compartment, said blower unit comprising a blower having an inlet side and a discharge side, and an air mixing chamber in communication with the inlet side of said blower, a first inlet orifice in the top-front-center of said product compartment in communication with said air mixing chamber for recirculating air flowing through said product compartment, a second air inlet orifice in communication with said air mixing chamber and with the outside air for introducing outside air into said mixing chamber, said first and second orifices being sized relative to each other to permit the introduction of predetermined amounts of recirculated air and outside air into said mixing chamber, a heating chamber in communication with the outlet side of said blower, heating means in said heating chamber, means for activating and deactivating said heating means, duct means in communication with said heating chamber, said duct means being positioned to convey heated air flowing through said heating chamber into said product compartment from the rear thereof, said duct means including air outlets positioned to direct heated air into said product compartment beneath each of said product receiving receptacles, and air venting means in the lower front wall of said product compartment to enhance the circulation of air throughout the lower frontal portion of said product compartment, said air vent means being spaced upwardly from the bottom of the product receiving compartment, whereby to stabilize the temperature of the air circulating in said product compartment.

4,446,781

APPARATUS FOR THE MECHANICAL/THERMAL TREATMENT, INCLUDING STERILIZATION AND PASTEURIZATION, OF FLUIDS

Armin Schmitt, Heusenstamm, Fed. Rep. of Germany, assignor to LUWA AG, Zurich, Switzerland

Filed Mar. 19, 1982, Ser. No. 359,783
Claims priority, application European Pat. Off., Mar. 21, 1981, 81102148.4
Int. Cl.³ A23G *1/00, 1/06*
U.S. Cl. 99—483 6 Claims



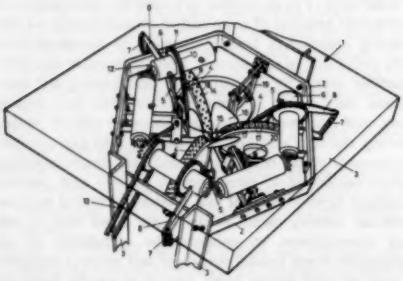
1. An apparatus for continuous mechanical/thermal treatment and sterilization of fluids including cocoa mass, with the cocoa mass being subjected to a thin layer deacidification, dehumidification and degasification treatment prior to and after the sterilization thereof, the apparatus comprising first and second spaced apart thin layer treatment systems, a degermination system placed between said first and second thin layer treatment systems and conveyor lines connecting said degermination system to said first and second thin layer treatment systems, said degermination system comprising a sterilization reactor for receiving and treating the cocoa mass flowing thereinto from said first thin layer treatment system, a heat exchanger placed outside of the sterilization reactor and coupled thereto for adjusting temperature fluctuations of the cocoa mass inside the reactor, and a cooling device coupled to the reactor for cooling the cocoa mass flowing out of the reactor and being directed to said second thin layer treatment system, the sterilization reactor being provided with an inlet opening at its top section and an outlet opening at its bottom section, and a branch line disposed on the outside thereof being connected to said outlet opening and terminating into its top section for partial recycling of treated cocoa mass therethrough.

4,446,782

BANANA PEELING MACHINE

Leslie Black, 21 Awatea, St. Ives, 2075 N.S.W., Australia

Filed Sep. 21, 1982, Ser. No. 420,906
Claims priority, application Australia, Sep. 24, 1981, PF0912
Int. Cl.³ A23N *7/00*
U.S. Cl. 99—589 10 Claims



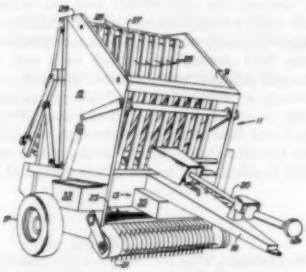
1. A banana peeling machine including at least three members each having a gripping face with means on the face to grip by engagement and penetration thereof the skin of a banana as it is moved in the direction of its longitudinal axis, the location and arrangement of each member being such that said gripping faces converge toward one another to provide a gap therebetween including a location of narrowest gap through which the banana to be peeled is passed with said gripping faces engaging and at least partially penetrating the skin of the banana, cutting members between each of the members at or near the narrowest gap to cut the skin of the banana along its longitudinal direction as it passes through the narrowest gap, the skin of the banana being retained and pulled from the banana flesh by the gripping faces as the banana moves away from the location of the narrowest gap, and drive means to move each of the members to engage and thereby pull a banana between the gripping faces and through the narrowest gap.

4,446,783

CYLINDRICAL BALER TWINE WRAPPING APPARATUS FOR WRAPPING BALE WITH TWO PIECES OF TWINE

Pierre Illy, Farrejueminef, France, assignor to Deere & Company, Moline, Ill.

Filed Mar. 30, 1983, Ser. No. 480,425
Claims priority, application European Pat. Off., Mar. 31, 1982, 82 400591
Int. Cl.³ B65B *13/18*
U.S. Cl. 100—5 7 Claims



1. In a twine wrapping apparatus for a cylindrical baler comprising a bale forming chamber and an opening in said chamber, said apparatus comprising:

a pair of twine guides on said baler and means for simultaneously driving said guides transversely of said baler for feeding pieces of twine through said opening and into said chamber for wrapping around a bale formed in said chamber;

the improvement wherein said drive means includes a drive interruption means for preventing the driving of said twine guides when only one of said twine pieces is being fed into said chamber and wrapped around the bale in said chamber.

4,446,784

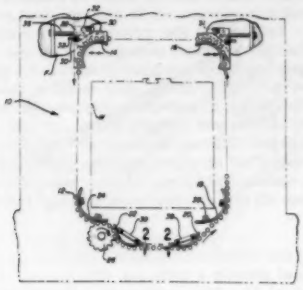
RESILIENT CHAIN STRAP WRAPPING AND TENSIONING DEVICE

Ronald W. Gurak, Fox River Grove, and Eduardo P. Diploma, Carol Stream, both of Ill., assignors to Signode Corporation, Glenview, Ill.

Filed Jun. 2, 1982, Ser. No. 384,220
Int. Cl.³ B65B *13/10*
U.S. Cl. 100—27 5 Claims

1. A chain strap wrapping and guiding device comprising a

chain mechanism including a plurality of crown-shaped rollers, a support structure, a plurality of V-shaped guides secured to



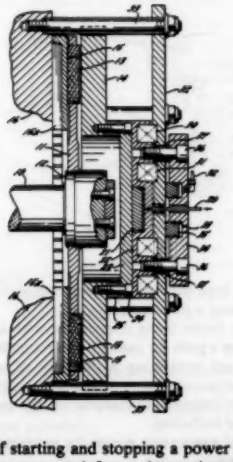
said support structure for guiding said rollers and means for driving said chain mechanism.

4,446,785

HYDRAULIC CLUTCHING AND BRAKING SYSTEM FOR STARTING AND STOPPING A POWER PRESS

Carl E. Tack, Jr., Oak Park, Ill., assignor to Danly Machine Corporation, Chicago, Ill.

Filed Sep. 28, 1981, Ser. No. 305,839
Int. Cl.³ B30B *15/10, 15/12*
U.S. Cl. 100—35 **22 Claims**



1. A method of starting and stopping a power press having a slide mechanism mounted for reciprocating movement, a press drive for cycling the slide mechanism, a clutch for connecting and disconnecting the press drive and the slide mechanism, and a brake for braking the press drive shaft, said method comprising

starting the press by hydraulically disengaging the brake and hydraulically engaging the clutch at a predetermined intermediate torque level which is less than the full clutch torque level,

maintaining the clutch at said intermediate torque level until the press drive shaft has attained substantially full speed, and then increasing the clutch torque to the full clutch torque level,

stopping the press by hydraulically disengaging the clutch and hydraulically engaging the brake at a predetermined intermediate torque level which is less than the full brake torque level, and

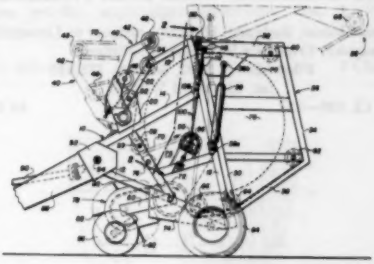
maintaining the brake at said intermediate torque level until the press drive shaft has substantially stopped, and then increasing the brake torque to the full brake torque level.

4,446,786

CAM GUIDE OPERATING MECHANISM FOR ROLL BALING MACHINE

Randy A. Greaser, Narvon, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Mar. 7, 1983, Ser. No. 472,458
Int. Cl.³ B30B *5/06*; A01D *39/00*
U.S. Cl. 100—88 **10 Claims**



1. In a roll baling machine including a base frame, a bale forming apron supported on said base frame defining an expandable bale chamber, guide means on said base frame movable between an extended position inside said bale chamber for supporting said bale forming apron in order to define an initial shape for said bale chamber and a retracted position outside said bale chamber, spring means for urging said guide means toward said extended position, the improvement comprising:

said guide means being movable from said extended position to said retracted position during bale formation without being opposed by said springs means; and

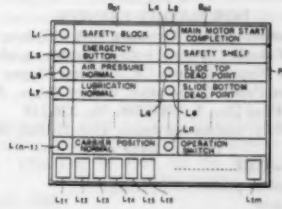
said springs means exerting force to urge said guide means toward said extended position only after a bale that is formed in said bale chamber has cleared said guide means during the discharge of the bale from the machine.

4,446,787

PREPARATIVE MONITORING APPARATUS FOR OPERATION OF A PRESS

Yoshinori Nishikawa, Kanazawa, and Iwashige Takahashi, Komatsu, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 21, 1982, Ser. No. 390,507
Int. Cl.³ B30B *15/00*
U.S. Cl. 100—99 **2 Claims**



1. A preparative monitoring apparatus for operation of a press wherein interlock conditions relating to a press operation are displayed during said press operation, comprising:

a display circuit including a plurality of lighting elements for displaying said interlock conditions and a display device for performing display of title of selected operation;

memory means for storing a plurality of reference interlock conditions corresponding to a type of press operation, establishment of said reference interlock conditions being indispensable for said press operation; and

a control circuit for comparing said reference interlock conditions with an actually established interlock conditions and for flickering said lighting elements corresponding to interlock conditions which do not coincide with said reference interlock conditions.

4,446,788

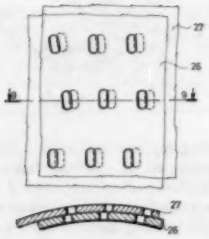
UNIVERSAL SCREW PRESS BUILT IN MODULAR SYSTEM

Zoltan Molnar, Budapest, Hungary, assignor to Licencia Talalmanyokat Ertekesito V., Budapest, Hungary

Filed Mar. 8, 1982, Ser. No. 355,915

Int. Cl.³ B30B *9/06, 9/14*

U.S. Cl. 100—117 **10 Claims**



1. A universal screw press comprising

(a) an inlet unit;

(b) a driving gear;

(c) a modular worm shaft;

(d) an outlet unit; and

(e) a modular housing,

wherein said modular housing comprises a first perforated housing unit provided with perforations the sizes of which are variable during operation, wherein the variably sized perforations of said first perforated housing unit are formed by a first and a second element of said first perforated housing unit, said first and second elements being displaceable in relation to each other during operation, wherein said first element of said first perforated housing unit is a perforated outer tube, said second element of said first perforated housing unit is a perforated inner tube, said inner and outer tubes have a common longitudinal axis are in contact and are rotatable with respect to one another about said longitudinal axis.

4,446,789

DOT MATRIX PRINTER

Michio Matsumoto; Masao Kitamura, both of Tokyo; Masataka Ohta, and Takeshi Ohshima, both of Kanagawa, all of Japan, assignors to Nippon Electric Co., Ltd. and Nippon Telegraph & Telephone Public Corporation, both of Tokyo, Japan

Filed Dec. 1, 1981, Ser. No. 326,319

Claims priority, application Japan, Dec. 1, 1980, 55-169286

Int. Cl.³ B41J *3/12*

U.S. Cl. 101—93.04 **11 Claims**

1. A dot matrix printer comprising:

a printer frame;

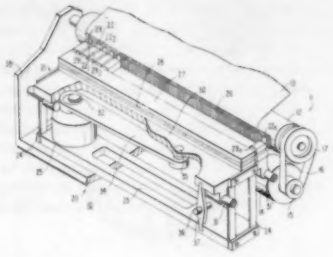
means for feeding paper to be printed;

a printer hammer bank mounted on said frame having a plurality of printer hammers aligned on said hammer bank;

balancing means;

a resilient member for connecting said balancing means to said hammer bank; and

means provided on said balancing means for driving said



hammer bank to reciprocate in a direction orthogonal to a feeding direction of said paper, wherein the combined mass of said balancing means and said means for driving is matched to the mass of said print hammer bank.

4,446,790

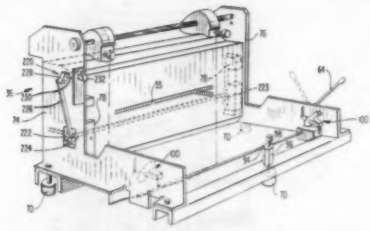
PRINTER WITH REMOVABLE PRINT CARRIAGE

Joseph Konkel, and David F. Sweeney, both of 99 Middlesex St., Malden, Mass. 02148

Continuation of Ser. No. 902,460, Apr. 20, 1978, abandoned. This application Jun. 29, 1981, Ser. No. 278,462

Int. Cl.³ B41J *1/20*

U.S. Cl. 101—93.14 **8 Claims**



1. A band-type data printer comprising a main frame releasably supporting a print carriage,

A. said main frame being cooperable with said print carriage for defining a path for passage of a recording medium therebetween and containing a plurality of actuable hammers mounted adjacent said path and cooperable with said print carriage to imprint information on the recording medium, and further including:

(1) carriage supporting means for supporting said print carriage, and

(2) carriage latch means cooperable with said print carriage for releasably securing said print carriage to said frame, said carriage latch means comprising:

i. a cam pivotally mounted on said frame and having a head cooperable with a notch in said print carriage,

ii. a trunnion pivotally mounted on said frame,

iii. a connecting rod having first and second rod heads, means for preventing said rod heads from separating by more than a predetermined distance, and a spring coaxial with said connecting rod for urging said rod heads apart to tend to keep said rod heads separated by said predetermined distance, said first and second rod heads being pivotally connected to said cam and said trunnion, respectively, at pivot points thereon separated from said cam and trunnion axes, respectively, to tend

to keep the pivot points separated by the predetermined distance so that said cam tends to rotate with rotation of said trunnion and there is a range of angular positions of said trunnion in which the axis of said connecting rod passes from one side of the trunnion axis through the trunnion axis to the other side thereof, and

iv. an arm on said trunnion extending outward of said frame for rotation of said trunnion through said range of angular positions from a first position, in which the connecting-rod axis is disposed on one side of the trunnion axis, to a second position, in which the connecting rod is disposed on the other side of the trunnion axis, the spring thereby applying torque to the trunnion in one direction when said arm is in the first position and in the opposite direction when said arm is in the second position, and

B. said print carriage further comprising:

(1) means defining a printing anvil adjacent said path, and

(2) means for rotatably mounting a printing band on said print carriage for cooperation with said anvil and said hammers when said print carriage is secured to said print frame to enable information to be printed on the recording medium.

4,446,791

INK CONTROL FOR A MULTI-CYLINDER STENCIL DUPLICATOR

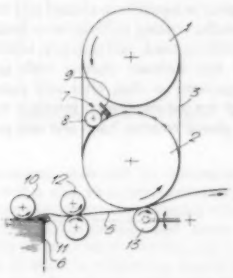
Colin R. Stevens, London, and Victor Ababurko, Bishops Stortford, both of England, assignors to Gestetner Manufacturing Limited, London, England

Filed May 14, 1982, Ser. No. 378,245

Claims priority, application United Kingdom, May 22, 1981, 8115823

Int. Cl.³ B41L *13/18*; B05C *11/10*

U.S. Cl. 101—122 **18 Claims**



1. A multi-cylinder stencil duplicator comprising:

(a) first and second cylinders;

(b) stencil support means for a stencil circulating around said first and second cylinders;

(c) a non-oscillating ink coating member positioned closely adjacent said first cylinder and defining therewith a nip for allowing an ink coating of predetermined substantially uniform thickness to pass through said nip on the surface of the said first cylinder;

(d) means for dispensing ink to a location on said first cylinder to one side of said nip such that during rotation of said first cylinder the ink is then passed directly through the nip for application as said substantially uniform coating to the said first cylinder;

(e) capacitive ink detector means, responsive to the electrical capacitance across the ink at said one side of the nip, for use in controlling the operation of said ink dispensing means to maintain a given build-up of ink on the said one side of the nip, said capacitive ink detector means comprising: first and second spaced elongate electrodes extending the length of said first cylinder and positioned with said build-up of the ink at said one side of said nip between said first and second elongate electrodes, and means for detecting the electrical capacitance between said first and second elongate electrodes along the length of said nip; and

(f) control means operatively connecting said capactive ink detector means and said ink dispensing means for controlling said ink dispensing means to operate in response to depletion of said ink build-up at said one side of said nip.

4,446,792

RADAR REFLECTOR FOR AN ARTILLERY SHELL

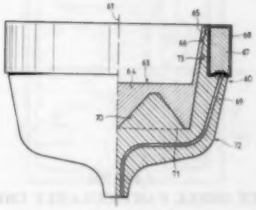
Rudolf Heller, Zurich, and Iwan Kahn, Wallisellen, both of Switzerland, assignors to Contraves AG, Zurich, Switzerland

Filed Nov. 9, 1981, Ser. No. 319,707

Claims priority, application Switzerland, Dec. 2, 1980, 8891/80

Int. Cl.³ F42B *15/02*

U.S. Cl. 102—473 **3 Claims**



1. A body which can be axially mounted on an artillery shell, comprising:

a functional element constructed as a radar reflector of the triple-mirror type containing triple mirrors and a sleeve element formed rotationally-symmetrical about a lengthwise axis of said body;

said body being integrally constructed from said functional element and said sleeve element and being formed turnably-symmetrical about the lengthwise axis of said body;

said sleeve element being capable of being fitted onto said artillery shell;

said body further including at least one explosive device arranged at least at the neighborhood of an outer surface of said sleeve element near to one end of said sleeve element and remote from said triple mirrors;

said explosive device being essentially rotationally-symmetrical about the lengthwise axis;

said explosive device being structured such as to establish upon its detonation a form-locking connection of said sleeve element with the shell; and

said explosive device coacting with said sleeve element such that upon detonation of said explosive device said sleeve element is severed at the region of said one end of said sleeve element in order to provide a substantially straight-lined closure of the sleeve element about the artillery shell in order to avoid undesirably altering ballistic characteristics of the artillery shell.

4,446,793

DISK DEPLOYMENT OF EXPENDABLES

Robert L. Gibbs, 161 Larkwood Cir., San Ramon, Calif. 94583

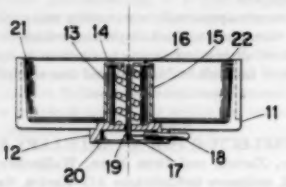
Filed Dec. 28, 1981, Ser. No. 334,597

Int. Cl.³ F42B *13/42*

U.S. Cl. 102—505 **3 Claims**

1. A spin stabilized disk, rotating about an axis which is initially perpendicular to the line-of-travel of the said disk while releasing a payload of radiation interference material as said disk proceeds away from a launcher device comprising: a disk case substantially closed at one end and containing a gear

teeth means around all or a part of its external circumferential surface to provide for the input of rotational forces to said disk during its launch, an internal cavity in the said disk case for



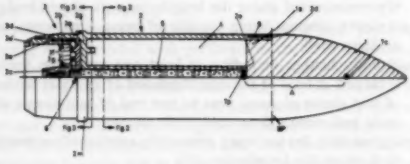
storing the said payload, a disk closure for the open end of said disk which contains the said payload until the instant of launch, a release mechanism means for the release of said disk closure immediately upon egress of said disk from its launching device.

4,446,794

PRACTICE SHELL PARTICULARLY USEFUL FOR TRAINING PURPOSES

Björn Simmons, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Continuation of Ser. No. 134,233, Mar. 26, 1980, abandoned. This application Sep. 7, 1982, Ser. No. 415,048
Claims priority, application Sweden, Apr. 2, 1979, 7902890
Int. Cl.³ F42B 9/20
U.S. Cl. 102—513 12 Claims



1. A practice shell for simulating a conventional shell for a large caliber firearm comprising:

a bottom unit and effect part made of plastic material resistant to high pressure;

said effect part having a casing coaxial with a tubular unit, said tubular unit and casing connected together by radially extending spoke elements forming an integral one piece structure, said spoke elements formed as wings extending along a major portion of the length of the tubular unit, said casing enclosing an indicator substance and an explosive charge, said effect part and bottom unit connected together at thick end walls which include reinforcing patterns in addition to said spoke elements to form an assembly to withstand stress forces which result from discharging said firearm; and a front part connected to a remaining end of said effect part, said front part made from a material heavier than the material from which said bottom unit and effect part are made, whereby

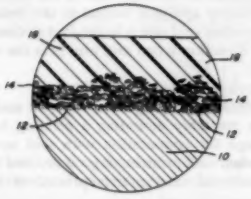
said front part, effect part, and bottom unit comprise a shell having a weight and ballistics substantially equivalent to said conventional shell.

4,446,795

METALLIC PROJECTILE BODY AND THERMOPLASTIC ROTATING BAND

Stephen J. Price, Crystal, and Charles R. Hargreaves, Maple Plain, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 193,680, Oct. 3, 1980, abandoned. This application Dec. 31, 1981, Ser. No. 336,230
Int. Cl.³ F42B 31/00
U.S. Cl. 102—527 8 Claims



1. A metallic projectile comprising:

a metallic projectile body having a band seat zone designated thereon;

a sprayed metallic coating on said band seat zone, said coating being characterized by (i) having a relatively rough external surface, i.e., a large number of irregularly shaped projections comprising a maze of mechanical attachments to said body, (ii) being at least 0.003 inches thick so as to be metallurgically continuous, thereby to prevent oxidation of said body at said band seat zone thereof and (iii) being metallurgically bonded to said projectile body so as to have a metal-to-metal bond strength; and

a polymer applied in liquid form around said zone and to said sprayed metallic coating to form, after hardening, a thermoplastic rotating band, said polymer, while in fluid form, permeating into intimate contact with said irregularly shaped projections so that, after said polymer becomes solid, a high torque transmittal interface is provided between said plastic rotating band and said projectile body.

4,446,796

TABLE AND IMPROVED HINGE MECHANISM

Kermit H. Wilson, Edina, and Ronald R. Carlson, Excelsior, both of Minn., assignors to Sico Incorporated, Minneapolis, Minn.

PCT No. PCT/US80/00568, 371 Date Jun. 23, 1980, 102(e) Date Jun. 23, 1980, PCT Pub. No. WO81/03269, PCT Pub. Date Nov. 26, 1981
PCT Filed May 16, 1980, Ser. No. 161,750
Int. Cl.³ A47B 1/04
U.S. Cl. 108—69 7 Claims

1. In a table, in combination:

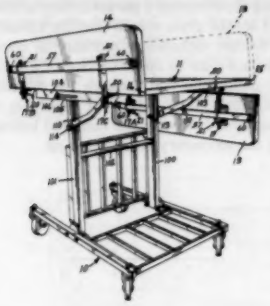
a wheeled support;

a table top;

an extensive leaf for said table top;

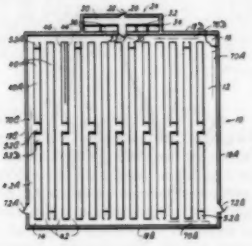
and means hinging said leaf to said table top for movement from a first position aligned with said top to second and third positions oppositely orthogonal to said top, including means operable to maintain said leaf in each of first and second positions, said means comprising a pivot member

including a pivot pin and a channel orthogonal thereto, and a slide member including a tongue sliding in said



channel and slotted to enable passage of said pivot therealong.

4,446,797
SELF-CONTAINED VAULT UNIT
Errol J. French, P.O. Box 1314, Chattanooga, Tenn. 37401
Filed May 11, 1981, Ser. No. 260,375
Int. Cl.³ E05G *1/00*
U.S. Cl. 109—53 **12 Claims**



9. A self-contained vault unit for containing a plurality of safety deposit boxes, said vault unit comprising:

means defining a secure interior chamber wherein said safety deposit boxes are contained, said means including wall means, floor means, and roof means, said wall means being reinforced to assist in preventing burglary,

a selectively operable security controlled entrance into said chamber,

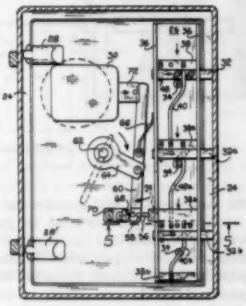
an entrance security room, including a further security controlled entrance which is selectively operable from the outside, which opens into said entrance of said chamber whereby a person entering said vault unit must pass through said entrance security room,

a plurality of elongated rows of cabinet sections arranged within said chamber in a substantially parallel relationship and defining aisles therebetween and perimeter aisles with respect to said wall means, said cabinet sections defining a plurality of openings having a preselected cross-sectional outline, each of said cabinet sections including opposite sides along their length,

a plurality of safety deposit boxes for inserting into said openings in said cabinet sections, each of said boxes including releasable lock means toward said aisles for releasibly securing said box within said cabinet sections upon moving said box to its closed position, said boxes being selectively movable from said cabinet openings upon release of said lock means, and

a plurality of inspection booths for inspecting the contents of said boxes, each of said booths including a table for positioning a box thereon during the inspection of said safety deposit box contents, and wherein every other row of said cabinet sections terminates at one of its end portions in a booth, and wherein every other row of said cabinet sections includes a pair of booths proximate its midportion which opens in opposite directions into said aisles on the opposite sides of said cabinet sections.

4,446,798
SAFE BOLT MECHANISM
Clinton E. Withington, 391 Stewart Dr., Hayward, Calif. 94544
Filed Mar. 26, 1982, Ser. No. 362,260
Int. Cl.³ E05G *1/04*
U.S. Cl. 109—61 **8 Claims**



1. An improved safe bolt mechanism for a safe including a main body and a safe door hinged to said main body, said safe bolt mechanism comprising:

a plurality of slide bolts coupled to an inner surface of said door for reciprocal axial movement between a bolted and an unbolted position, each slide bolt being provided with a transverse cam aperture and a transverse locking pin bore substantially parallel thereto;

guide means attached to said inner surface in proximity to said slide bolts;

a plurality of guide bars interspaced with said slide bolts and guided by said guide means for reciprocal motion substantially perpendicular to the axes of said slide bolts, said guide bars having extending locking pins coaxial with each of said locking pin bores said locking pin engages one of said locking pin bores when said slide bolts are in said bolted position;

a plurality of elongated cam rods coupling successive guide bars together, each of said cam rods being journaled within the cam aperture of one of said slide bolts; and

lockable bolt actuating means for reciprocally moving said guide bars along said guide means to urge said slide bolts between said bolted and said unbolted positions.

4,446,799
FLUIDIZED BED FUEL FEED SYSTEM
Mark S. Andersen, Agawam, Mass., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed May 7, 1982, Ser. No. 376,098
Int. Cl.³ F23D *1/00*
U.S. Cl. 110—263 **3 Claims**

1. A system for feeding granulated solid materials, including a fuel, a sulfur absorbent, and a recycle material into a fluidized bed combustor, said combustor having a combustion zone with at least an upper and a lower region therewithin, and said recycle material having been elutriated previously from the combustion zone of said fluidized bed combustor, comprising:

a walled chamber surrounding the fluidized bed combustion

zone, including a plurality of feed openings in the wall of the chamber;

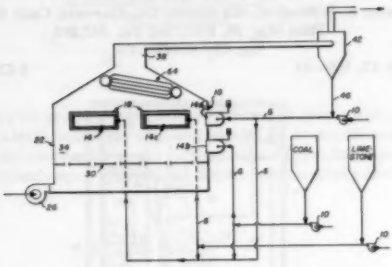
means for conveying the coal;

means for conveying the sulfur absorbent;

means for conveying said recycle material;

at least three nozzles, each with an exit opening, for separately receiving the conveyed solid materials and discharging each material from the nozzle exit openings;

means for supporting each of said nozzles in relation to the chamber and the fluidized bed combustion zone so as to



permit the movement of said nozzles and to concurrently require each discharged material to pass through the respective feed opening and into a specific region within the fluidized bed combustion zone, the location of each of said regions being dependent upon the orientation of the respective nozzle; and

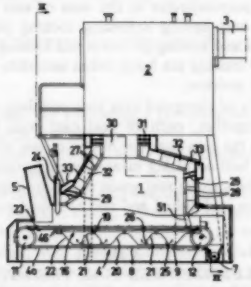
means for independently moving each of said nozzles, thereby changing the location of said specific regions within the fluidized bed combustion zone into which each material is discharged.

4,446,800

APPARATUS FOR FIRING SOLID FUELS

Anders Lövgren, Myckle, Sweden, assignor to HB Megaron, Sweden

Filed Mar. 9, 1982, Ser. No. 356,358
Int. Cl.³ F23N *11/10*
U.S. Cl. 110—270 **9 Claims**



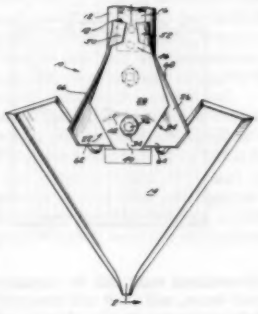
1. An apparatus for combusting solid fuels such as forest waste material in the form of bark and/or chips, and other biological materials including peat, comprising a furnace, a heat medium portion being connected to the furnace, grate means located in the furnace for feeding fuel from a fuel charge opening through the furnace while the fuel is being combusted in a furnace space, flue gases flowing from said furnace space through the heat medium portion to a chimney, at least one intake for supplying a controlled supply of at least primary and secondary combustion air to the furnace space, the grate means having a rear portion, seen in the direction of movement, located outside the furnace space proper but in connection therewith, said rear portion forming a drying zone adjacent the charge opening for effecting a partial drying of the fuel before the fuel is fed by the grate means into the furnace space, the grate means further including a plurality of transverse dogs running in contact with an upper surface of a stationary grate plane for advancing the fuel through the furnace, the grate plane being located above means for supplying the primary combustion air from below to the fuel, and below air intakes for supplying the secondary combustion air.

4,446,801

AIR SEEDING BOOT

Cecil Machnee, Yorkton, and Fred N. Butuk, Insinger, both of Canada, assignors to Morris Rod Weeder Co., Ltd., Saskatchewan, Canada

Filed Jul. 14, 1982, Ser. No. 398,449
Int. Cl.³ A01C *5/00*
U.S. Cl. 111—86 **19 Claims**



1. An air seeding boot used to deliver material such as seed, fertilizer, or chemicals to be deposited onto the soil prepared by a soil working tool, the boot being adapted to mount on a mounting shank together with a soil working tool and to be secured to the shank with at least one bolt also used to mount the soil working tool thereto in such a manner that the bolts used do not fasten across a part of the boot which is easily compressed, said boot comprising:

a front part for the purpose of deflecting the soil moved by the soil working tool away from the area where dispensed material will be deposited;

a back part which diffuses and separates dispensed material into two portions and allows the material to be deposited on the soil prepared by the soil working tool in two rows generally separated and generally equal; and

the two said parts mating with one another to form a hollow body having an opening on the top portion for receiving a material delivery conduit, and having two generally equal openings on the bottom portion of the hollow body, the openings being of generally oval shape inclined backward and upward from the lower portion of the hollow body

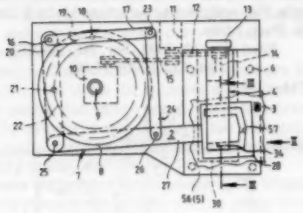
the two said parts being directly and rigidly bolt-connectable to said shank by said working tool mounting bolt which bolt avoids passage through said hollow body.

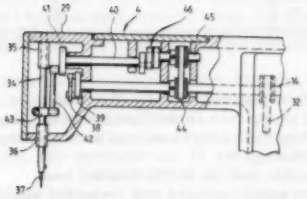
4,446,802

AUTOMATIC SEWING MACHINES

Hans Scholl, Oerlinghausen-Lipperreihe, Fed. Rep. of Germany, assignor to Kochs Adler AG, Fed. Rep. of Germany

Filed Jun. 21, 1983, Ser. No. 506,432
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1982, 3225046
Int. Cl.³ D05B *21/00, 55/14*
U.S. Cl. 112—121.12 3 Claims





1. An automatic sewing machine having a feeding device for imparting a continuous movement to a workpiece during the sewing process, a sewing head including a needle bar arranged to be driven in oscillatory manner by an arm shaft by means of a gear drive, and a mechanism for reducing the deflection of the needle during the insertion of the latter into the workpiece, said mechanism comprising a double gear drive connected between the arm shaft and the gear drive for the needle bar and adapted to reduce the angle of rotation during which the needle is inserted into a workpiece.

4,446,803

UPPER FABRIC FEED FOR A SEWING MACHINE

Karl Nicolay, and Klaus Hampel, both of Bielefeld, Fed. Rep. of Germany, assignors to Dürkoppwerke GmbH, Bielefeld, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 321,073, Nov. 13, 1981, abandoned. This application Feb. 24, 1982, Ser. No. 351,871
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1980, 3043141
Int. Cl.³ D05B *27/04*
U.S. Cl. 112—320 7 Claims

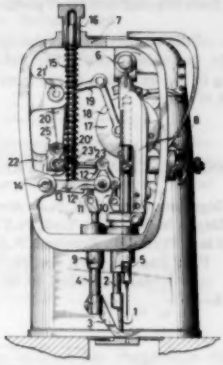
1. In a method of operating a fabric feed for a sewing machine wherein:

a feed foot and a holddown foot are each vertically oppositely reciprocable between a respective upper position and a respective lower fabric-engaging position;

a continuously operating rotary drive has a rotating output whose rotary motion is transformed by an appropriate linkage into alternating reciprocation of the feed foot and the holddown foot; and

the feet are alternately engaged with and disengaged from fabric in the respective fabric-engaging positions, the improvement wherein:

on moving downward from their upper into their lower positions the feet are each first accelerated to a maximum speed reached when approximately midway between said upper and lower positions and thereafter are decelerated



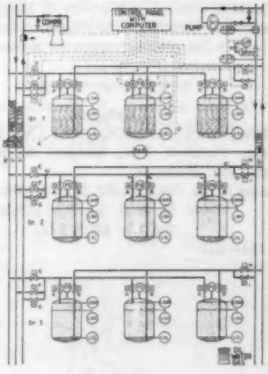
to an intermediate speed lying between zero and seven-tenths of said maximum speed reached when they attain the respective lower fabric-engaging position.

4,446,804

METHOD OF TRANSPORTING OIL AND GAS UNDER HIGH PRESSURE IN TANKS ON BOARD A SHIP

Olaf Kristiansen, Moss, and Bo Brännstrom, Hovik, both of Norway, assignors to Moss Rosenberg Verft A/S, Moss and Saga Petroleum a.s. & Co., Sandvika, both of, Norway

PCT No. PCT/NO81/00031, 371 Date Feb. 16, 1982, 102(e) Date Feb. 16, 1982, PCT Pub. No. WO82/00186, PCT Pub. Date Jan. 21, 1982
PCT Filed Jul. 8, 1981, Ser. No. 355,592
Claims priority, application Norway, Jul. 8, 1980, 802054
Int. Cl.³ B63B *25/14*
U.S. Cl. 114—74 R 3 Claims



1. A method of transporting oil and gas under high pressure in tanks on board a ship, wherein loading and unloading are carried out utilizing a suitable liquid under pressure, for example water, in the individual tanks, said loading comprising filling a tank or group of tanks containing pressurized liquid with oil and gas while the pressurized liquid simultaneously becomes displaced into a next tank or group of tanks which are to be filled, after which the said next tank/group of tanks are filled with cargo while the pressurized liquid becomes displaced into a third tank/group of tanks, etc., and said unloading comprises removing the cargo from one tank or one group

of tanks by introducing a pressurized liquid into the tank/group of tanks, the unloading of the cargo in the next tank/group of tanks occurring through the transfer of the pressurized liquid from the said first tank/group of tanks to the next, etc.

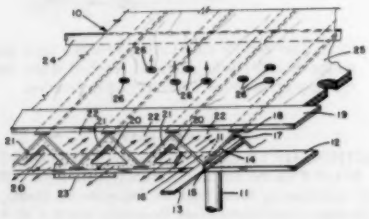
the ratio of the oil/gas mixture being held as constant as possible throughout the entire unloading operation by phasing in the unloading of gas from the various tanks or groups of tanks.

4,446,805

DECK CONSTRUCTION FOR REFRIGERATED CARGO SHIPS

Byron M. Sugahara, Bloomfield, N.J.; Avrum A. Freelund, and George Zinger, both of New York, N.Y., assignors to Reefer Express Lines Pty., Ltd., Roseland, N.J.

Filed Jun. 25, 1981, Ser. No. 277,272
Int. Cl.³ F26B *19/00*
U.S. Cl. 114—76 **5 Claims**



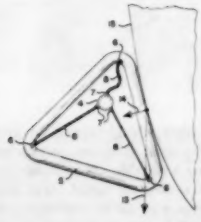
1. A deck construction for tween decks for refrigerated cargo ships comprising; a vertically-supported structural member, a lower transverse flange supported on said vertically-supported structural member, a corrugated member supported on said transverse lower flange, said corrugated member having an alternate series of longitudinally-extending V-shaped supply air channels and an intermediate series of inverted V-shaped return air channels, an upper transverse flange supported on said corrugated member, a plurality of longitudinally spaced bearer members extending transversely across said corrugated member, and a flat grating supported above said corrugated member.

4,446,806

SINGLE POINT MOORING AND FENDER

René Loire, Houston, Tex., assignor to Morrison-Knudsen Company, Inc., Boise, Id.

Continuation of Ser. No. 146,606, May 5, 1980. This application Mar. 30, 1982, Ser. No. 363,408
Int. Cl.³ E02B *3/22*
U.S. Cl. 114—219 **7 Claims**



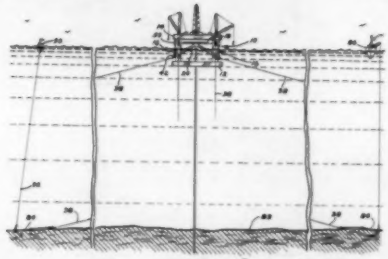
1. A single point mooring comprising a dolphin and the like fixed in the ocean bottom, a plurality of rigid fender segments joined end to end and forming an endless member positioned in a horizontal plane surrounding the dolphin, a plurality of flexible yielding means, each having one end connected to the dolphin and the other end connected to the endless member, said flexible yielding means being connected to the endless member at vertices formed by said segments whereby contact between the endless member and the dolphin is resisted by at least one of the flexible yielding means.

4,446,807

MOORING APPARATUS FOR FLOATING VESSELS

Charles A. Johnson, Lakeville, Minn., and Laurence H. Lucker, Jr., Media, Pa., assignors to American Hoist & Derrick Company, St. Paul, Minn.

Filed Jun. 10, 1981, Ser. No. 270,857
Int. Cl.³ B63B *21/50*
U.S. Cl. 114—230 **2 Claims**



1. A platform-mounted apparatus for drawing in, storing, holding, and paying out a flexible load line having the properties of wire rope and having a load at an outer end thereof, said apparatus including:

A. said flexible load line and its attached load;

B. a power supply mounted with respect to said platform and capable of supplying hydraulic fluid under pressure;

C. winch means including:

(1) a winch frame mounted with respect to the platform,

(2) a winch drum to which an inner end of the load line is attached, said drum being rotatably mounted on said frame,

(3) braking means operably connected between the drum and the winch frame,

(4) hydraulic drum drive means operable to rotate the drum to move the load line in a first direction as it winds on the drum, the drum drive means being operable selectively to power the drum

(a) in a slow speed/high torque range, or

(b) in a high speed/low torque range, and

(5) fluid operable brake control means to cause the braking means selectively to

(a) let the winch drum run free,

(b) to retard rotation of the winch drum, or

(c) to stop it and to hold it against rotation with respect to the winch frame;

D. a hydraulically operable linear load line pull machine mounted with respect to the platform and encompassing a straight run of the load line between said winch drum and said line load, said linear load line pull machine including:

(1) a linear line pull machine frame mounted with respect to the platform,

(2) wedge shape gripper jaws slidably mounted on said pull machine frame and adapted to releasably grasp the encompassed portion of the load line to hold it against movement in a second direction opposite the first direction of movement of the load line when it is wound on the winch drum,

(3) hydraulic linear pull drive means operable when applied with hydraulic fluid under pressure to move said jaw means reciprocally with respect to said pull machine frame

(a) to cause the load line when grasped by the jaw means to move in the first load line direction and

(b) to move in the jaws in a second direction, and

(4) hydraulic gripper motor means operable in a disengaging direction to disengage said jaw means from said load line and in an engaging direction to cause said jaw means to grasp said load line; and

E. control means selectively operable to:

(1) supply hydraulic fluid under pressure from the power supply to the drum drive means and actuate the drum drive means into its high speed/low torque range, actuate the gripper motor means in the disengaged direction, and actuate the brake control means to release the braking means, or

(2) supply hydraulic fluid under pressure from the power supply to the drum drive means and actuate the drum drive means into its low speed/high torque range, actuate the gripper motor means in the disengaged direction, and actuate the brake control means to release the braking means, or

(3) actuate the gripper motor means in the engaged direction to position the gripper jaws to grasp the load line, supply hydraulic fluid under pressure from the power supply to the drum drive means and actuate the drum drive means into its high speed/low torque range, supply hydraulic fluid under pressure from said power supply to said linear line pull drive means, and actuate said brake control means to release the braking means.

4,446,808

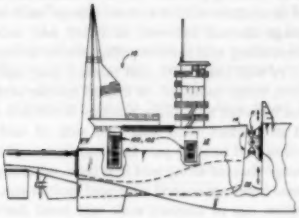
BARGE-TUG CONNECTION APPARATUS

Jean P. Colin, Metairie, La., assignor to Ateliers et Chantiers de Bretagne A.C.B., Nantes, France

Continuation-in-part of Ser. No. 116,616, Jan. 29, 1980, Pat. No. 4,347,801. This application Jul. 13, 1981, Ser. No. 282,810

Int. Cl.³ B63B *21/60*

U.S. Cl. 114—248 **21 Claims**



1. A barge and tug connection apparatus comprising:

a. a barge providing a V-notch portion for receiving a tug thereinto, the V-notch portion having a generally uniform horizontal section with its bottom open to the sea;

b. a tug for pushing the barge with the notch of uniform horizontal section allowing the tug to pitch and heave along its entire length within the notch relative to the barge;

c. a plurality of inflatable pad assemblies mounted on the tug, each comprising an outer housing having an outer movable wear surface positioned to bear and slide against the barge at sea and inner inflatable means for maintaining the wear surface in contact with the barge absent substantial clearance at sea;

d. pushing line means for maintaining the tug in the notched portion of the barge; and

e. bow fender means mounted on the bow of the tug and facing the notch for longitudinally spacing the bow of the tug from the barge, the barge and the fender means each having smooth surfaces which can bear and slide against each other so that during normal operation the bow of the tug can freely pitch and heave responsive to wave action and with respect to different elevational positions of the barge.

4,446,809

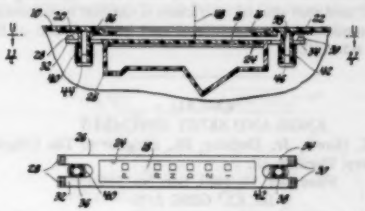
ADJUSTABLE LENS FOR A TRANSMISSION RATIO INDICATOR

Robert P. Dennis, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 2, 1982, Ser. No. 345,066

Int. Cl.³ G09F *9/00*

U.S. Cl. 116—28.1 **2 Claims**



1. An improvement in automatic transmission ratio indicating mechanisms having a position indicator movable in a transmission lever housing, and a lens structure attached to said housing with indicia disposed thereon which cooperate with said position indicator to indicate the transmission ratio selected, wherein the improvement comprises; a lens housing disposed in said transmission lever housing including a wall portion having two resilient finger members formed integral thereon, another wall portion having a pair of support flanges and two groups of housing teeth formed integral thereon, a lens member with the indicia thereon disposed between the wall portions and being urged toward the toothed wall portion by said resilient finger members, and two groups of lens teeth disposed on said lens member and cooperating with the respective wall portion teeth to position said lens member in said lens structure, said resilient finger members being operable to urge engagement between respective groups of teeth and said lens member being deflectable against said resilient member upon application of a force thereto for disengaging said respective groups of teeth to permit movement of said lens member in said lens housing relative to said position indicator to establish alignment of said position indicator and said indicia.

4,446,810

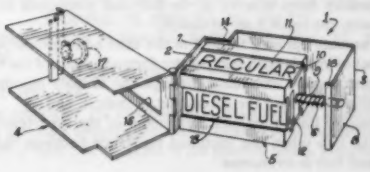
ROTARY INDICATOR

Nick Bressi, 4886 Normandy Pl., La Mesa, Calif. 92041

Filed Mar. 18, 1983, Ser. No. 476,534

Int. Cl.³ G09F *9/00, 11/02*

U.S. Cl. 116—307 **7 Claims**



1. A rotary indicator which comprises:

a mounting frame;

a drum having a plurality of peripheral message-holding stations;

means for rotatably mounting said drum within said frame;

said means for rotatably mounting comprising:

a shaft axially and slidingly engaging a hole in the center of said drum;

said shaft being supported at each end by elements of said frame;

releasable means for preventing rotational movement of said drum within said frame;

said means for preventing comprising one of said elements defining a spacial restriction; and resilient means for biasing said drum toward said spacial restriction;

at least one message display mountable in said stations;

and comprising an oblong tag carrying a message on at least one of its faces;

each of said message-holding station comprising means for securing said tag; and wherein said frame comprises a backwall and first and second sidewalls supporting said shaft; and said spacial restriction is defined by an inward indentation at the juncture of said backwall and of first said sidewall.

4,446,811

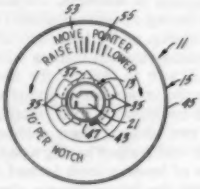
KNOB AND SKIRT ASSEMBLY

Robert K. Howie, Jr., Decatur, Ill., assignor to The Grigoleit Company, Decatur, Ill.

Filed Oct. 13, 1981, Ser. No. 310,435

Int. Cl.³ G05G *1/10*

U.S. Cl. 116—309 **6 Claims**



1. A knob and skirt assembly having a dial which can be calibrated relative to a control shaft, said assembly including:

a knob having a handle portion and a hub portion,

the hub portion having a control shaft receiving socket at one end and a stop on the hub located inwardly of the socket end,

a disc shaped skirt having a central opening adapted to receive the hub and to engage the stop to position the skirt relative to the hub,

means to secure the skirt against the stop of the hub and frictionally resist rotation of the hub and the skirt relative each other until a predeterminal rotational force is applied to overcome this frictional resistance,

a first set of indicia applied to the shirt on the handle portion side thereof along the circumferential periphery of the skirt,

a second set of indicia applied to the skirt on the hub portion side therof along the circumferential periphery thereof,

a pointer fixed relative to the hub and positioned to align with the second set of indicia,

an arcuate opening formed in the skirt adjacent the second set of indicia with said pointer formed as part of the handle portion and extending through the arcuate opening for alignment with the second set of indicia, and

means to limit rotational movement of the skirt relative to the hub when the frictional resistance between the skirt and hub is overcome.

4,446,812

GALVANIZATION INSTALLATIONS OF METALLIC BANDS

Robert Wang, Wissous, France, assignor to Stein Heurtey, Ris-Orangis, France

Filed May 3, 1982, Ser. No. 374,262

Claims priority, application France, May 7, 1981, 81 09061

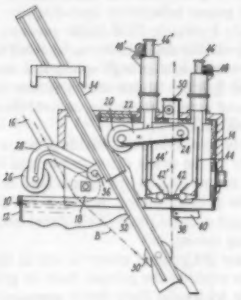
Int. Cl.³ B05C *1/08, 3/172*

U.S. Cl. 118—63 **5 Claims**

1. An installation for galvanizing a metal band on one or both sides thereof, said installation comprising:

a tank containing a molten zinc bath and through which a metal band to be coated is passed continuously;

means for causing said band selectively to pass along a first path and for galvanizing both sides of said band or along a second path and for galvanizing one side only of said band, said means comprising:



a fixed first return roller positioned above the upper surface of said bath at a location to be contacted by a first side of said band during passage thereof along either said first or second paths;

a second return roller mounted on a first mobile arm for movement between a rest position out of contact with said band during passage thereof along said first path and a working position in contact with said first side of said band during passage thereof along said second path;

a coating roller mounted on a second mobile arm for movement between a rest position out of contact with said band during passage thereof along said first path and a working position partially immersed in said bath and in contact with a second side of said band during passage thereof between said first and second return rollers along said second path, thereby coating said one face of said band with said molten zinc; and

a bottom roller mounted on a third mobile arm for movement between a working position immersed in said bath and in contact with said first side of said band and causing said band to pass into and from said bath during passage thereof along said first path, whereby both sides of said band are coated with said molten zinc, and a rest position out of contact with said band during passage thereof along said second path; and

means for removing excess molten zinc from said band after passage thereof through either said first or second paths thereof.

4,446,813

MOULD HANDLING, CLEANING AND PREPARATION SYSTEMS

Edward J. Kinkopf, and Karl L. Polen, both of Alliance, Ohio, assignors to The Alliance Machine Company, Alliance, Ohio

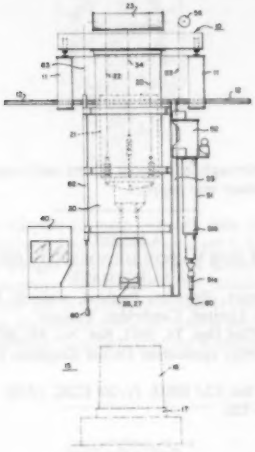
Filed Mar. 17, 1983, Ser. No. 476,123

Int. Cl.³ B05C *5/00, 7/02, 13/02*

U.S. Cl. 118—72 **5 Claims**

1. A mould handlng, cleaning and preparation apparatus comprising a bridge extending transversely across a work area, wheels at each end of said bridge adapted to run on rails carried by a building framework alongside the work area, drive means for driving at least one wheel at each end of said bridge, a trolley on said bridge movable from end to end lengthwise of the bridge, wheels on said trolley, guide rails on said bridge receiving and guiding said trolley, drive means on the trolley for driving at least a part of said wheels on the trolley, a main guide frame extending vertically from said trolley, a main lift column movable vertically in said main guide frame, means on the trolley for vertically moving said lift column, a pair of

opposing tongs pivoted on the lift column opposite the trolley, means on the trolley and lift column for opening and closing said opposing tongs, a secondary guide frame on one side of said main guide frame, a cleaning column vertically movable on said secondary guide, a drive shaft rotatable in said secondary column, drive means in the secondary column for rotating said drive shaft, a cleaning head pivotally attached to the cleaning column and drive means for rotation about the end of



said column, cleaning means on said cleaning head for engaging the interior of a mould to be cleaned, a spray head guide rail fixed to a side of the main guide frame, a spray head movable vertically on said guide rail, reservoir means on the main guide frame for holding a liquid mould treating composition and flexible connecting means between said spray head and reservoir.

4,446,814

DEVICE FOR APPLYING A FLUID, IN PARTICULAR LACQUERS ON PRINTED SHEETS OR CONTINUOUS WEBS

Paul Abendroth, and Janko Despot, both of Offenbach am Main, Fed. Rep. of Germany, assignors to M.A.N. - Roland, Fed. Rep. of Germany

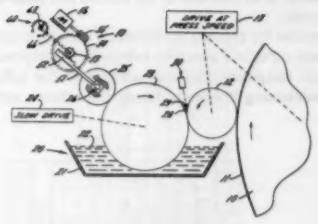
Filed Feb. 9, 1982, Ser. No. 347,144

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1981, 3105020

Int. Cl.³ B05C *1/00*

U.S. Cl. 118—694 **2 Claims**

1. In a printing press the combination comprising an applicator cylinder for receiving a film of lacquer from an associated counterrotating applicator roller, means for driving the cylinder and applicator roller at press speed, a fountain supplying the lacquer and having a fountain roller partially immersed in a reservoir of lacquer disposed below said fountain roller, means for driving the fountain roller so that it picks up a coating of lacquer from said reservoir, said fountain roller engaging the applicator roller so that some of the lacquer is transferred from the fountain roller to the applicator roller, a metering roller engaging the fountain roller, means for adjusting the transaxial spacing between the metering roller and the fountain roller so that a film of regulated thickness is applied to and transferred by the applicator roller, said fountain roller driving means being operable to drive said fountain roller in a counterrotative direction with respect to the applicator roller with the contacting applicator roller and cylinder surfaces being rotated upwardly at the nip between the applicator roller and the cylinder so that there is no significant buildup of lacquer at the nip between the applicator roller and the cylinder and with the contacting fountain roller and applicator roller surfaces being rotated downward at the nip between the fountain roller and



the applicator roller so that the lacquer tends to buildup at the nip between the fountain roller and the applicator roller, the engagement of the fountain roller and the applicator roller causing a desired thickness of lacquer to be transferred to the cylinder when the buildup of lacquer is at an optimum level in the nip between the fountain roller and applicator roller, means including a sensing device located at the nip between the fountain roller and applicator roller for sensing said buildup of lacquer and for producing an output signal upon departure of the buildup from an optimum level, and means responsive to an input signal from the sensing device for acting upon the adjusting means to bring about a corrective adjustment in the position of the metering roller with respect to the fountain roller so that said lacquer buildup in the nip tends to be restored to the optimum level.

4,446,815

APPARATUS FOR CONTINUOUSLY DEPOSITING A LAYER OF A SOLID MATERIAL ON THE SURFACE OF A SUBSTRATE BROUGHT TO A HIGH TEMPERATURE

Reinhard Kalbskopf, Vordemwald; Otto Baumberger, Carouge, both of Switzerland, and Serge Masson, Orange, France, assignors to Societa Italiana Vetro SIV SpA, San Salvo, Italy

Filed Dec. 14, 1982, Ser. No. 449,773

Claims priority, application Switzerland, Dec. 22, 1981, 8211/81

Int. Cl.³ B05B *7/00*; C23C *13/10*

U.S. Cl. 118—718 **5 Claims**

1. In apparatus for continuously depositing on a substrate heated to a high temperature a solid coating resulting from the union of at least two reagents in the gaseous phase, comprising

(a) a first source of a first reagent, which is gaseous or diluted in a carrier gas;

(b) a second source of a second reagent, which is gaseous or diluted in a carrier gas;

(c) a nozzle having three tuyeres, each tuyere having an opening formed by a rectilinear slit and lateral walls which define the planes of the longitudinal edges of the slit, the direction of the lateral walls converging towards a common imaginary line, a first said tuyere being flanked by the other two and being adjacent, on one hand, to a second said tuyere at the junction point of their respective walls and, on the other hand, to a third said tuyere at the

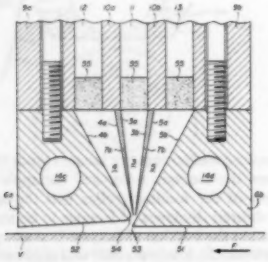
junction point of their respective walls, so that gases ejected by the tuyeres are projected towards the said common line;

(d) first and second deflector surfaces which are rigid with the nozzle and which are to face the substrate, the said deflector surfaces extending over a given distance on respective sides of the tuyeres from the external longitudinal edges of the openings of the second and third tuyeres, respectively;

(e) first distribution means connecting the first reagent source to the first tuyere of the nozzle;

(f) second distribution means connecting the second reagent source to at least one of the second and third tuyeres of the nozzle;

(g) means for moving the substrate and the nozzle relative to each other in a direction substantially perpendicular to the said imaginary line and parallel to the substrate, while maintaining constant, during the relative movement, the



distance separating the tuyere openings and the deflector surfaces from the substrate; and

(h) means for removing from the space between the deflector surfaces and the substrate reaction gases produced in this space;

the improvement that the first deflector surface extends on the upstream side with respect to the direction of movement of the substrate relative to the nozzle and is perpendicular to the median plane of the nozzle, the first deflector surface forming a sharp edge at an acute angle with the external wall of the third tuyere, which wall is extended beyond the internal wall, the sharp edge being transversely offset in the direction of the said movement with respect to the said median plane of the nozzle, the second deflector surface forming, in contrast, a blunt edge with the corresponding external longitudinal wall of the second tuyere, such that a nozzle opening defined between the said edges is bent and the gases emerging from it are deflected in the direction of movement of the substrate and substantially parallel to the substrate.

4,446,816

APPARATUS FOR MANUFACTURING A MAGNETIC RECORDING MEDIUM

Tatsuji Kitamoto, and Ryuji Shirahata, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

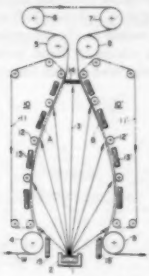
Division of Ser. No. 265,123, May 19, 1981, Pat. No. 4,395,439. This application May 3, 1983, Ser. No. 475,674

Claims priority, application Japan, May 20, 1980, 55-66877

Int. Cl.³ C23C *13/08*

U.S. Cl. 118—718 **16 Claims**

1. An apparatus for manufacturing a magnetic recording medium comprising: a molten metal evaporating source; and means for transporting a flexible belt-shaped support above said evaporating source at a substantially constant speed along a curved path formed such that evaporated metal flow lines connecting a central point on an evaporation surface of said molten metal to said support form a substantially constant angle of incidence with respect to a longitudinal direction of



said support throughout an area where said evaporated metal flow lines contact said support.

4,446,817

APPARATUS FOR VAPOR DEPOSITION OF A FILM ON A SUBSTRATE

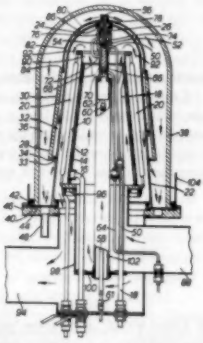
John A. Crawley, Royston, England, assignor to Cambridge Instruments Limited, Cambridge, England

Filed Dec. 14, 1981, Ser. No. 330,262

Claims priority, application United Kingdom, Dec. 20, 1980, 8040921

Int. Cl.³ H01L *21/20*; C23C *13/08*

U.S. Cl. 118—725 **19 Claims**



1. Vapour deposition apparatus for the deposition of a film on a substrate, comprising

a source of radiant heat,

mounting means for mounting the substrate to be heated by the radiant heat source,

means defining a passageway over the substrate,

means for passing reactant gas through the passageway so as to cause vapour deposition on the heated substrate, and

shielding means preventing the reactant gas coming between the source of radiant heat and the substrate.

4,446,818

HANGER FOR CONVEYOR TUBES AND THE LIKE

Preston D. Rigterink, Milford, Ind., assignor to Chore-Time Equipment, Inc., Milford, Ind.

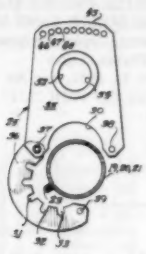
Filed Jun. 1, 1982, Ser. No. 383,464

Int. Cl.³ A01K *5/00*

U.S. Cl. 119—52 AF **8 Claims**

8. A hanger for supporting a conveyor tube in a given angular position, the tube comprising at least one tube section hav-

ing a tube body and a radially extending flange, the tube body defining a feed drop-out aperture located at a predetermined angular position relative to the tube flange, the hanger comprising a hanger element defining a hole for receiving the conveyor tube, and a series of recesses communicating with and arrayed along the bottom periphery of the tube hole, each



recess being adapted to mate with the tube flange so as to locate the tube and feed drop-out aperture in a given angular position, the hanger further defining a series of attachment holes for permitting the hanger to be attached to support structure in any one of a series of angularly discrete positions, so as to locate the carried conveyor tube in any one of a corresponding number of angularly discrete positions.

4,446,819

METHOD AND AN APPARATUS FOR AUTOMATICALLY SUPPORTING AND RESTRAINING BIRDS, AND PREFERABLY YOUNG CHICKS, SAID METHOD AND APPARATUS IN A PREFERRED EMBODIMENT BEING APPLIED FOR AUTOMATICALLY DEBEAKING SAID BIRDS

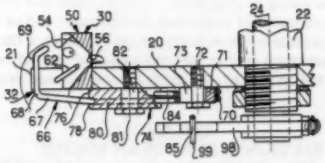
Albert J. A. Gourlandt, Les Grésillons, 78950 Gambais, France

Division of Ser. No. 184,970, Sep. 8, 1980, Pat. No. 4,375,814. This application Sep. 30, 1982, Ser. No. 430,604

Claims priority, application France, Sep. 14, 1979, 79 23018

Int. Cl.³ A01K *37/00*

U.S. Cl. 119—97 R **22 Claims**



1. A method for automatically supporting and restraining live animals including birds, comprising:

providing a plurality of spaced apart supports, each support comprising means for holding the animal by its head with the head immobilized without injury.

moving said supports so that each of said supports follows a path successively passing through a loading station and an unloading station,

inserting an animal into a said support in said loading station, and

releasing said animal from said support in said unloading station.

4,446,820

STEAM GENERATOR HEATED BY LIQUID METAL

Walter Jansing, Bergisch-Gladbach, and Kurt Vinzens, Overath-Immekeppel, both of Fed. Rep. of Germany, assignors to INTERATOM Internationale Atomreaktorbau GmbH, Bergisch-Gladbach, Fed. Rep. of Germany

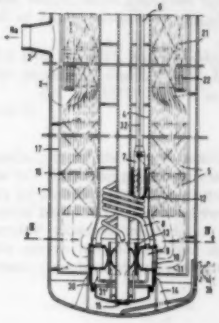
PCT No. PCT/EP79/00093, 371 Date Jul. 28, 1980, 102(e) Date Jul. 28, 1980, PCT Pub. No. WO80/01101, PCT Pub. Date May 29, 1980

PCT Filed Nov. 23, 1979, Ser. No. 241,833

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1978, 2851197

Int. Cl.³ F22B *1/02, 37/24*

U.S. Cl. 122—32 **7 Claims**



1. Helical tube steam generator heated by liquid metal, comprising a container, a central pipe being disposed in said container and having a closed lower end, at least one down pipe being disposed in said central pipe for feed water and having a lower end, a shell disposed between said container and said central pipe, a plurality of groups of helical tubes disposed one above the other in said shell defining horizontal interspaces between said groups of helical tubes in which said tubes are extended in a straight line, further groups of intermediate superheating tubes disposed in said shell, a plurality of distributing pipes being disposed one above the other and being helically disposed within each other, said distributing pipes having first ends connected to the lower end of said feed water down pipe and second ends, and peripherally spaced apart secondary distributors for said groups of helical pipes being connected to said second ends of said distributing pipes.

4,446,821

INTERNAL COMBUSTION ENGINE METHOD FOR DELAYED REACTION STRATIFIED COMBUSTION

Roy S. Cataldo, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 20, 1982, Ser. No. 341,114

Int. Cl.³ F02B *41/00*

U.S. Cl. 123—26 **6 Claims**

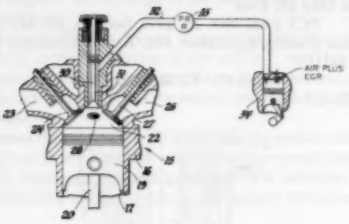
1. A delayed reaction stratified combustion method of operating an engine having a variable volume combustion chamber in which combustible fuel-air mixtures are burned to produce power, inlet means for separately supplying primary and secondary inlet charges to said combustion chamber, means for igniting the primary charges and exhaust means for exhausting the burned products, said method comprising

supplying to the combustion chamber and compressing therein without substantial dilution primary charges of rich fuel-air mixture having a sufficient excess of fuel over a stoichiometric value to provide when ignited rapid combustion with relatively low production of nitrogen oxides,

igniting and partially burning said compressed primary charges during initial portions of sequential combustion

events, said initial portions extending over essentially the first third of the elapsed time of their respective combustion events,

then, during subsequent intermediate portions extending over essentially the central third of their respective combustion events, supplying supplemental charges of oxidizing and diluting gas to the burning primary charges in



amount sufficient to provide for the substantial completion of combustion during essentially the latter two thirds of the respective combustion events by continued rapid combustion with increasingly diluted mixtures, and

expanding the combustion chamber volume during and subsequent to said combustion events whereby a high efficiency, low NO_x power producing combustion cycle is provided.

4,446,822

HEAT INSULATING MOUNTING DEVICE FOR CARBURETOR

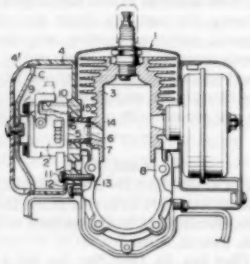
Hisashi Inaga, Tokyo, and Yoetsu Yokocho, Tachikawa, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Apr. 27, 1982, Ser. No. 372,278

Claims priority, application Japan, May 25, 1981, 56-74614[U]

Int. Cl.³ F02B *77/11*

U.S. Cl. 123—41.31 **1 Claim**



1. In an internal combustion engine including at least one engine cylinder, said engine having an engine well with an opening therethrough. In the passage through said opening of a mixture of air and fuel, said engine wall having a carburetor mounted adjacent thereto, the improvement comprising:

a heat insulating mounting device for mounting said carburetor adjacent said engine wall through heat insulating material, said heat insulating mounting device comprising a heat insulating casing and a separate air-permeable casing lid, said heat insulating mounting device surrounding said carburetor and extending between said wall of said engine and said carburetor, said casing being connected to said cylinder in a manner to isolate the carburetor from the heat of radiation of said engine, and a flexible air passageway of small thickness passing through said casing to form a heat insulating path for air and fuel between said carburetor and said opening through said engine wall, said flexible air passageway being surrounded by said casing and being formed of a heat insulating high molecular compound of rubbery properties.

4,446,823

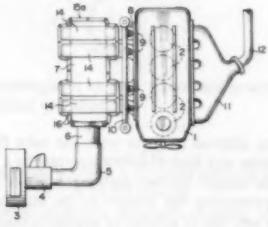
INTERNAL COMBUSTION ENGINE PASSAGE CONSTRUCTION WITH INTAKE TUBES EXTENDING ALONG SURGE TANK WALL

Hironori Bessho, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 13, 1981, Ser. No. 321,193

Int. Cl.³ F02B *75/13*

U.S. Cl. 123—52 MB **3 Claims**



1. An intake passage construction for a multi-cylinder combustion engine, comprising:

(a) a surge tank of a tubular shape having a rectangular cross section, comprising a side wall which defines four sides of said rectangular cross section, and an inlet through which air is admitted into said surge tank; and

(b) a plurality of intake tubes of a rectangular cross section having four sides, each comprising a first portion formed all around said surge tank with said side wall of said surge tank serving as a common wall portion which defines one side of the four sided rectangular cross section of said intake tube, a second portion connected to said first portion and formed on said first portion of said intake tube over the width of one side of the four-sided rectangular cross section of said surge tank with one side wall portion of said first portion of said intake tube serving as a common wall portion which defines one side of the four sided rectangular cross section of said second portion of said intake tube, and a third portion connected to said second portion and having an independent tubular wall portion, thus providing a spiral intake tube, an inner end of which is opened into said surge tank and an outer end of which is in communication with one of the cylinders of the internal combustion engine, said outer ends of said tubes being connected to said engine along a common side thereof.

4,446,824

SUCTION SYSTEM IN AN ENGINE

Norio Endo, Kameoka; Yoshiaki Asayama, and Masami Kabuto, both of Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Mitsubishi Jidosha Kogyo K.K., both of Tokyo, Japan

Division of Ser. No. 125,745, Feb. 28, 1980, Pat. No. 4,361,119. This application Jan. 20, 1982, Ser. No. 341,147

Claims priority, application Japan, Mar. 1, 1979, 54-25951

Int. Cl.³ F02B *75/18*

U.S. Cl. 123—52 M **1 Claim**

1. An air intake assembly for use with an internal combustion engine, which comprises:

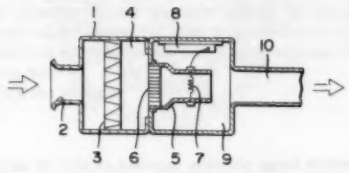
air inlet means comprising an air cleaner casing having an inlet port for receiving air into said assembly from the ambient space around said assembly and having an outlet

port formed in an inner wall and air cleaner means in said casing between said inlet and outlet port;

an expansion chamber on the outside of said air cleaner casing and abutting said inner wall of said air cleaner casing and having an inlet port formed in an inner wall thereof and opening directly into said outlet port of said air cleaner casing and further having an outlet port;

a duct connected to said outlet port of said expansion chamber for discharging air from said assembly; and

flow detector means disposed completely within said expansion chamber and having an inlet end mounted in and



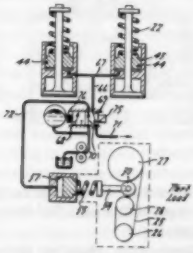
filling said expansion chamber inlet port and being supported solely in said expansion chamber by a portion of said inner wall of said expansion chamber defining said inlet port thereof so as to be spaced from the outer walls of said expansion chamber and receiving all the air flowing through said air cleaner means, said flow detector means having an outlet end opening into said expansion chamber and having means for detecting a flow rate of air flowing through said flow detector means from said air inlet means to said expansion chamber, and means connected to said detecting means for producing an electrical signal corresponding to said flow rate.

4,446,825

INTERNAL COMBUSTION ENGINE WITH VALVES HAVING A VARIABLE SPRING RATE

Dante S. Giardini, Dearborn Heights; Richard V. Iwanski, Belleville, and David K. Trumpy, Farmington Hills, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 16, 1982, Ser. No. 369,060
Int. Cl.³ F01L *3/10*
U.S. Cl. 123—90.65 **9 Claims**



1. In an internal combustion engine having a crankshaft, a camshaft, and a timing belt interconnecting said crankshaft and camshaft, an apparatus for controlling the operational event of valves in said internal combustion engine, said valves being moved to a closed position by a spring and activated for opening by the conversion of rotary motion from said camshaft into a linear opening motion of the valve, the apparatus comprising:

(a) first hydraulic means responsive to an increase at or above a minimum high speed condition of said engine for increasing the spring rate of said valve closing spring and for reducing the spring rate under said minimum high speed condition;

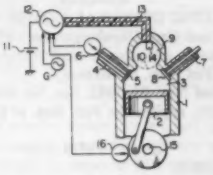
(b) second hydraulic means having a spring biased idler pulley for maintaining tension on said belt, said second hydraulic means being responsive to an increase at or above said minimum high speed condition for decreasing the rate of said spring biasing idler pulley and for increasing said tension when said engine speed is below said minimum high speed condition.

4,446,826

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Katsuhiro Kimura, Tokyo; Akira Endo, and Jiro Takezaki, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 30, 1981, Ser. No. 335,692
Claims priority, application Japan, Jan. 7, 1981, 56-385
Int. Cl.³ F02P *23/04*
U.S. Cl. 123—143 B **4 Claims**



1. An ignition system for an internal combustion engine comprising a cylinder for said engine, a piston which reciprocates within said cylinder, a combustion chamber defined by the cylinder and said piston, a power supply loop provided on a part of said combustion chamber, a microwave generator circuit for generating a microwave as ignition energy, and a coaxial cable through which the microwave is supplied from said microwave generator circuit to said power supply loop, wherein a microwave applied to the power supply loop will cause the combustion chamber to be put in the resonance state and generate a plasma discharge, whereby combustible gas introduced in the combustion chamber can be ignited; wherein said combustion chamber is divided into a primary combustion chamber and a secondary combustion chamber, and said secondary chamber functions as a cavity resonator; and wherein a filter is provided in an opening between said primary and secondary combustion chambers, said filter allowing no passage of the microwaves and passage of the combustible gas.

4,446,827

CYLINDER BLOCK OF INTERNAL COMBUSTION ENGINE

Takao Kubozuka, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

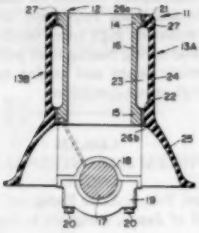
Filed Jun. 15, 1981, Ser. No. 273,727
Claims priority, application Japan, Jun. 21, 1980, 55-87332[U]
Int. Cl.³ F02F *1/10*
U.S. Cl. 123—195 R **7 Claims**

1. A cylinder block of an internal combustion engine, comprising:

an integrally formed metallic main body including a cylinder section which forms therein engine cylinders, and bearing bulks, a part of a water jacket being formed around said cylinder section; and

first and second side cover members secured respectively to the opposite side surfaces of said main body so as to maintain a fluid-tight seal therebetween, each side cover member including a water jacket outer wall section defining thereinside a part of said water jacket, and a skirt section defining thereinside a crankcase and securely connected

to said bearing bulks, said skirt section being integral with said water jacket outer wall section, and said first and



second side cover members being made substantially entirely of a non-metallic material which is light in weight and high in vibration damping capacity.

4,446,828

RECIPROCATING INTERNAL COMBUSTION ENGINE

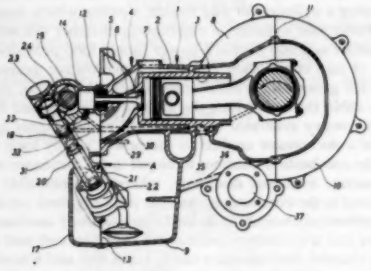
Armin Bauder, and Gerd Ohrnberger, both of Neckarsulm, Fed. Rep. of Germany, assignors to Audi Nsu Auto Union Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 24, 1982, Ser. No. 444,481

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1981, 3146799

Int. Cl.³ F01M *1/00*

U.S. Cl. 123—196 R **5 Claims**



1. A reciprocating piston internal combustion engine, including a cylinder head, a cylinder block providing the cylinder bores, a crankcase, an oil sump, and a camshaft case, and including a main casting which constitutes said cylinder head and cylinder block and also forms part of said crankcase and part of said oil sump, and including a second casting which forms said camshaft case together with a cover for said oil sump, and in which said cylinder head is formed with a locating surface for said camshaft case, and said oil sump has an opening for said oil sump cover lying in the same plane as the locating surface on said cylinder head.

4,446,829

ROTARY INTERNAL COMBUSTION ENGINE

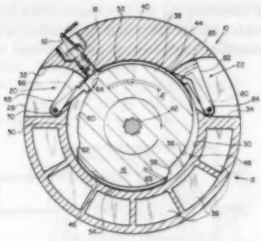
Zema O. Yeager, 19 Lake Rd., East Hampton, Conn. 06420

Continuation-in-part of Ser. No. 223,042, Jan. 7, 1981, abandoned. This application Dec. 9, 1981, Ser. No. 328,816

Int. Cl.³ F02B *53/00*

U.S. Cl. 123—244 **33 Claims**

1. A rotary internal combustion engine having a stationary block assembly defining a cylindrical chamber, a rotor supported for coaxial rotation within the chamber and having angularly spaced lobes and angularly spaced pockets separated by said lobes, one of said pockets being defined by a portion of the peripheral surface of said rotor, another of said pockets being defined by a radially outwardly opening channel formed in said rotor, a plurality of angularly spaced seal assemblies pivotally supported within recesses in said block assembly and having sealing surfaces engaging said rotor, each of said seal assemblies including inner and outer seal members, said inner



seal members being pivotally movable relative to said outer seal members and being movable into and out of said channel and sealingly engageable with associated walls of said channel as said rotor rotates within said cylindrical chamber, and biasing means for urging said seal assemblies toward sealing engagement with said rotor.

4,446,830

METHOD OF OPERATING AN ENGINE WITH A HIGH HEAT OF VAPORIZATION FUEL

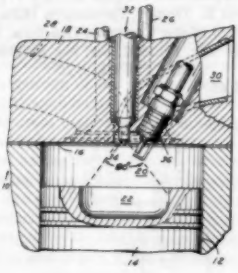
Aladar O. Simko, Dearborn Heights; Peter H. Havstad, Livonia, both of Mich., and Joseph A. Harrington, Naperville, Ill., assignors to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US83/00029, 371 Date Jan. 10, 1983, 102(e) Date Jan. 10, 1983

PCT Filed Jan. 10, 1983, Ser. No. 465,858

Int. Cl.³ F02F *3/26*

U.S. Cl. 123—276 **7 Claims**



1. A method of operating an internal combustion engine of the spark ignition type with a neat fuel having a high heat of vaporization, comprising:

charging the combustion chamber defined between the cylinder head and the top of the piston having a central cavity therein with a volume of air having a moderate swirl rate induced by the intake system;

injecting a first portion of the total fuel charge having a high heat of vaporization such as methanol and the like into the chamber shortly after top dead center (TDC) position of the piston at the start of the intake stroke so that essentially all of the first portion fuel charge is injected into the piston cavity;

injecting at moderate pressure levels with a conical spray pattern producing relatively low penetration and at such a

fast rate and for such a short duration that the injection of the first fuel portion is terminated shortly after the start of injection and while still within the intake stroke;

continuing the induction of air into the chamber as the piston continues to descend during the intake stroke so that additional swirling air enters the chamber and cavity to effect evaporation and misting of the fuel charge and movement of the fuel charge from the cavity to the rest of the chamber whereby the heavier fuel droplets are centrifuged to the cavity walls to be contained therein and absorb the heat from the walls and the incoming air to cool the same;

injecting the remaining portion of the total fuel charge into the chamber during the later part of the compression stroke of the engine just prior to ignition with low penetration to assure a rich air/fuel mixture adjacent the spark plug; and

igniting the mixture.

4,446,831

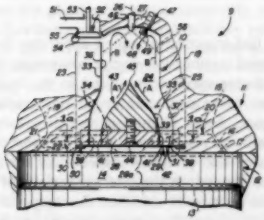
PRECOMBUSTION CHAMBER FOR INTERNAL COMBUSTION ENGINE

Noel G. Artman, 15830 Nicklaus La., Sun City, Ariz. 85351

Filed Apr. 7, 1982, Ser. No. 366,446

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—286 **15 Claims**



1. A precombustion chamber structure for an internal combustion engine cylinder having a variable volume space in which air is compressed during the compression stroke of a piston therein, said chamber structure having enclosing the chamber thereof a sidewall with an inner periphery surrounding and facing radially inwardly relatively to having a principal axis of the chamber and having opposite endwalls spaced apart axially of said axis and of the chamber, the chamber structure also including in one of the endwalls a passage means having a passage annular in transverse section surrounding said axis and communicating between the variable volume space and the interior of the chamber and operable to conduct air therethrough from said space into the chamber pursuant to the compression stroke of the piston, said annular passage having an outer periphery facing radially inwardly that constitutes an unbroken continuation of the sidewall inwardly facing periphery, said passage means and chamber sidewall being configured to create a vortex of said conducted air encircling said axis within the chamber adjacently to the one endwall, and vortex flow control means disposed contiguously with said one endwall but projecting axially inwardly of the chamber relatively to said passage means and spaced from said sidewall radially inwardly therefrom toward said axis, and said flow control means being configured to conduce contractive convergence of a portion of said vortex radially toward said axis.

4,446,832

METHOD AND SYSTEM FOR CONTROLLING THE IDLE SPEED OF AN INTERNAL COMBUSTION ENGINE AT VARIABLE IGNITION TIMING

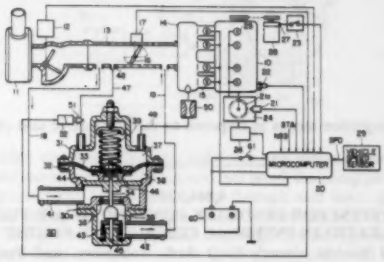
Toshimi Matsumura, Ohbu; Hideya Fujisawa, Kariya; Norio Omori, Kariya; Takashi Arimura, Kariya; Hisamitsu Yamazoe, Kariya, and Kiyotaka Nishiura, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 13, 1981, Ser. No. 321,227

Claims priority, application Japan, Nov. 14, 1980, 55-160977

Int. Cl.³ F02P *5/04*; F02M *7/12*; F02D *11/10*

U.S. Cl. 123—339 **6 Claims**



1. An idle speed control system for a spark ignition internal combustion engine having a main air delivery means for introducing air to the engine in response to a manual command, an auxiliary air delivery means for introducing additional air to said engine according to an adjustable setting and means for causing ignition to occur in said engine at variable timing according to an adjustable setting, the system comprising:

engine parameter monitor means for monitoring a plurality of engine operating parameters including a parameter indicative of the speed of the engine, and

data processing means responsive to a plurality of the monitored engine operating parameters for detecting when said engine is in an idle state, deriving a reference engine speed setting from the monitored engine operating parameters when said idle state is detected, detecting the deviation of the monitored engine speed from said reference speed setting, and simultaneously adjusting the settings of said variable ignition timing and said auxiliary air delivery means according to said deviation.

4,446,833

FUEL INJECTION APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Yukio Matsushita, Iwata, and Toshikatsu Nozaki, Shizuoka, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha and Sanshin Kogyo Kabushiki Kaisha, both of, Japan

Filed Dec. 3, 1982, Ser. No. 446,726

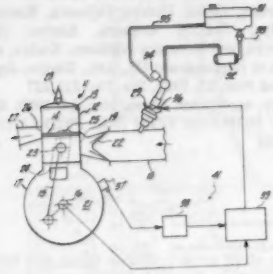
Claims priority, application Japan, Dec. 7, 1981, 56-195668

Int. Cl.³ F02M *7/00, 51/00*; F02B *33/04*

U.S. Cl. 123—435 **36 Claims**

1. In a fuel injection control system for an internal combustion engine comprising a chamber in which an intake charge is compressed during engine operation and fuel injection means

for delivering fuel to an air charge, the improvement comprising means for controlling the amount of fuel delivered by said



fuel injection means in response to the pressure in said chamber.

4,446,834

SYSTEM FOR FEEDBACK CONTROL OF AIR-FUEL RATIO IN INTERNAL COMBUSTION ENGINE

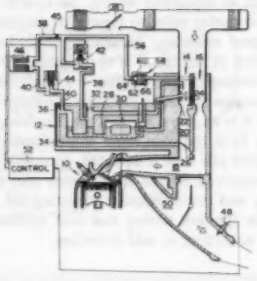
Kenji Yoneda, Atsugi; Shoji Arai, Yokohama, and Yoshimi Kunome, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Nov. 10, 1981, Ser. No. 319,997

Claims priority, application Japan, Nov. 12, 1980, 55-159114

Int. Cl.³ F02M *37/00*; F02B *73/10*; F02M *25/06*; F01N *3/00*

U.S. Cl. 123—440 **7 Claims**



1. In a system for feedback control of the air-fuel ratio of an air-fuel mixture fed to an internal combustion engine,

a carburetor having a main fuel passage provided with an air bleed passage;

said control system including an auxiliary air bleed passage communicating with said main fuel passage;

an electromagnetic valve disposed in said auxiliary air bleed passage so as to control the air flow rate through said auxiliary air bleed passage;

an exhaust sensor disposed in an exhaust passage of the engine for detecting the concentration of a specific component of the exhaust gas discharged from the engine as an indication of the air-fuel ratio of an air-fuel mixture burned in the engine and deriving a feedback signal representative of the detected concentration;

control means for producing a control signal based on said feedback signal and supplying said control signal to said electromagnetic valve to correct any deviation of the air-fuel ratio represented by said feedback signal from a predetermined air-fuel ratio;

a vacuum passage opening into a venturi section of an intake passage of the engine and connected to said auxiliary air bleed passage; and

a vacuum-responsive flow restriction valve so arranged in said vacuum passage as to (a) block said vacuum passage while the magnitude of vacuum in said venturi section is below a predetermined level and (b) gradually open in dependence on the magnitude of said vacuum when the magnitude of said vacuum rises above said predetermined level.

4,446,835

LIQUID FUEL INJECTION PUMPING APPARATUS

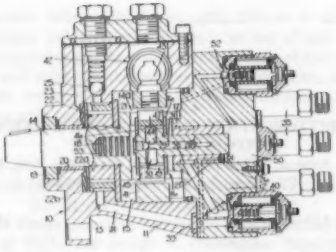
Dorian F. Mowbray, Burnham, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Oct. 27, 1981, Ser. No. 315,514

Claims priority, application United Kingdom, Dec. 31, 1980, 8041547

Int. Cl.³ F02M *59/28*; F04B *1/06*

U.S. Cl. 123—450 **3 Claims**

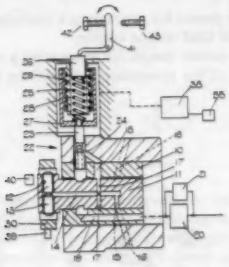


1. A liquid fuel injection pumping apparatus for supplying fuel to an internal combustion engine comprising a body part, a rotary distributor member mounted in the body part and arranged in use to be driven in timed relationship with the associated engine, bores formed in the distributor member, plungers in said bores respectively, cam followers positioned at the outer ends of said plungers respectively for engagement with cam lobes formed on the internal surface of a cam ring surrounding the distributor member, the cooperating surfaces of the cam followers and the cam ring being complemental and shaped such that outward movement of the plungers is controlled according to both the axial and radial positions of the cam followers with respect to the cam ring with a first axial position of the cam followers relative to the cam ring permitting outward movement of the plungers during a filling stroke farther than outward movement of the plungers permitted when the cam followers are in a second axial position relative to the cam ring with plungers associated with cam followers in the first axial position moving inwardly before plungers associated with cam followers in the second axial position, passage means for conveying fuel to and from said bores during rotation of the distributor means, the complementary surfaces on the followers and a portion rotatable with the distributor member limiting the outward movement of the plungers, means for adjusting the axial setting of the distributor member within the body part whereby the amount of fuel which can be delivered by the apparatus during inward movement of the plungers can be varied, adjusting means for reducing the initial rate of fuel delivery by reducing the number of plungers delivering initial flow, comprising moving means to adjust the axial position of less than the total number of the cam followers with respect to the cam ring in said first axial position while leaving the axial position of the remaining cam followers with respect to the cam ring unchanged in the second axial position, said adjusting means including means responsive to the speed of operation of the apparatus of activating said moving means.

4,446,836
FUEL INJECTION PUMPING APPARATUS

Dorian F. Mowbray, Burnham; Ivor Fenne, Greenford, and Richard J. Andrews, Guildford, all of England, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Sep. 28, 1982, Ser. No. 425,965
Claims priority, application United Kingdom, Oct. 23, 1981, 8132016
Int. Cl.³ F02M *41/00*
U.S. Cl. 123—450 **7 Claims**



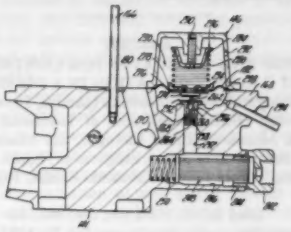
1. A fuel injection pumping apparatus of the rotary distributor type comprising a housing, a rotary distributor member mounted in the housing and adapted to be driven in timed relationship with an associated engine, a bore formed in the distributor member and a plunger slidable therein, cam means defining a leading flank for imparting inward movement to the plunger as the distributor member rotates and a trailing flank which allows the plunger to move outwardly, a delivery passage in the distributor member, said delivery passage communicating with said bore and opening onto the periphery of the distributor member for registration in turn with a plurality of outlets during successive inward movements of the plunger, said outlets in use being connected to the injection nozzles respectively of the associated engine, a low pressure pump for supplying fuel to said bore, means for controlling the quantity of fuel supplied to the bore whilst the plunger is allowed to move outwardly, said means comprising an electrically controlled on/off valve interposed between the low pressure supply pump and the bore and electronic means for controlling said on/off valve, said electronic means being responsive to the relative angular position of the trailing flank of the cam means and the distributor member, whereby the valve is closed to prevent further flow of fuel to the bore when said relative angular position attains a predetermined value.

4,446,837
PRESSURE REGULATOR-ACCUMULATOR FOR USE WITH MECHANICAL DIAPHRAGM PUMP

David G. Elpern, Hamtramck, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 781,263, Mar. 25, 1977, abandoned. This application Apr. 9, 1979, Ser. No. 27,707
Int. Cl.³ F02M *69/00*
U.S. Cl. 123—460 **10 Claims**

1. In a fuel management system, for an internal combustion engine having a source of fuel supply, throttle body means mounted on the engine having throat means for delivering fuel to the engine, and pump means for delivering fuel from the supply to the engine, a fuel accumulator, control and regulating assembly comprising fuel bowl means formed in the throttle body means having a fuel accumulating cavity integrally formed therein and an inlet connecting said cavity to the pump means for receiving fuel from the pump means, said fuel bowl means having an outlet formed therein communicating said cavity with the throat means, injector means disposed in said cavity and contiguous with said outlet for controlling the flow of fuel in a pulsed fashion from said cavity to the throat means, and inlet metering regulator means positioned in said cavity and contiguous with said inlet for controlling the flow of fuel into said cavity and regulating the pressure of the fuel in said fuel accumulating cavity, said inlet metering regulating means including a valve seat and a valve assembly having a valve stem and valve head affixed thereto, said valve head being

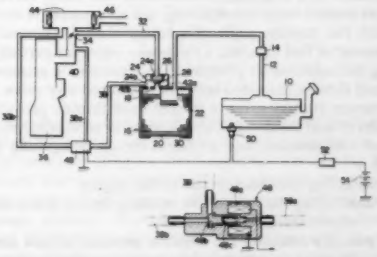


mateable with said valve seat, and diaphragm means connected to said valve stem and closing said fuel bowl, the pump providing pressurized fuel to said cavity through said inlet, spring means urging said diaphragm means toward said valve seat, said fuel pressure moving said diaphragm means against the urging of said spring away from said valve seat and said valve head toward engagement therewith.

4,446,838
EVAPORATIVE EMISSION CONTROL SYSTEM

Mikio Suzuki, Zushi, and Masafumi Yamazaki, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Nov. 30, 1982, Ser. No. 445,838
Claims priority, application Japan, Dec. 1, 1981, 56-177732[U]
Int. Cl.³ F02M *33/02*
U.S. Cl. 123—520 **7 Claims**



1. In a motor vehicle having an engine, an air cleaner connected to said engine through an intake tube, and a fuel tank, an evaporative emission control system comprising:
- a fuel vapor adsorbing canister connected to said fuel tank through a fuel vent tube;
- a purge control valve connected to said canister and adapted to be responsive to the induction vacuum prevailing in said intake tube;
- a two way valve;
- a first conduit leading from said purge control valve to said two way valve;
- a second conduit leading from said two way valve to said intake tube;
- a third conduit leading from said two way valve to the clean side of said air cleaner;
- said two way valve connecting said first and second conduits when assuming a first postion, and connecting said first and third conduits when assuming a second position;

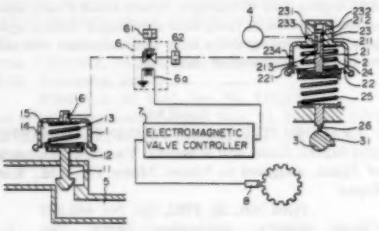
a control circuit operatively connected to said two way valve, said control circuit including means for sensing a parameter indicative of said fuel vapor adsorbing canister being saturated and unable to adsorb any further fuel vapor, said control circuit being adapted to induce said two way valve to assume said second position thereof upon said means sensing a saturated condition of said fuel vapor adsorbing canister.

4,446,839

METHOD AND APPARATUS FOR CONTROLLING EXHAUST GAS RECIRCULATION IN A DIESEL ENGINE

Kiyonori Sekiguchi, Aichi; Toshihiko Igashira, Toyokawa; Takeshi Tanaka; Hisasi Kawai, both of Toyohashi; Mitsumasa Yamada, Mishima; Michio Kawagoe, and Masaaki Tanaka, both of Susono, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jul. 9, 1982, Ser. No. 396,682
Claims priority, application Japan, Jul. 10, 1981, 56-106918
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—569 **4 Claims**



1. A method for controlling EGR in a diesel engine having an EGR valve, a pressure supplying means for supplying air pressure to a diaphragm chamber of said EGR valve, a pressure control valve for adjusting said air pressure in accordance with the rotation angle of a rotary shaft for controlling the amount of fuel injected, a three-way valve for partially releasing said adjusted air pressure to an atmospheric pressure, a first fixed throttle provided between said three-way valve and said pressure control valve, a second fixed throttle provided at an inlet of said three-way valve leading to an atmosphere, a rotation rate detector, and a control means, comprising the steps of:

detecting the rotation rate of the engine,

controlling the ratio of the opening time to the closing time of said three-way valve, and

partially releasing the negative pressure in said diaphragm chamber to an atmospheric pressure corresponding to the rotation rate of the engine detected by the rotation rate detector,

whereby the rate of EGR is decreased in accordance with an increase in the rotation rate, at least in an operating condition higher than a predetermined rotation rate.

4,446,840

EXHAUST GAS RECIRCULATION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Toyoaki Nakagawa, Yokosuka; Masao Nakajima, Atsugi; Yoshihisa Kawamura, and Giichi Shioyama, both of Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Nov. 12, 1982, Ser. No. 441,036
Claims priority, application Japan, Nov. 20, 1981, 56-186498
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—571 **2 Claims**

1. An exhaust gas recirculation control system for an internal combustion engine having an intake passage and an exhaust passage, comprising:

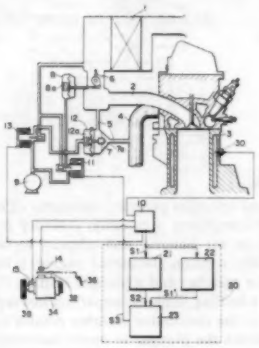
a throttle valve disposed within the air intake passage for movement between a predetermined partially closed position and a fully opened position;

means defining an exhaust gas recirculation passage connecting the exhaust passage to that portion of the intake passage which is located downstream of said throttle valve;

an E.G.R. control valve having a valve element disposed within said exhaust gas recirculation passage for movement between a closed position and a fully opened position,

a load sensor means for generating a load signal indicative of the state of load on the engine;

a revolution sensor means for generating a revolution signal indicative of the revolution speed of the engine;



means responsive to at least one of said load signal and said revolution signal for generating an engine operating state indicative signal indicating that the engine operates in a predetermined state wherein the E.G.R. flow rate higher than a predetermined E.G.R. flow rate is required;

means responsive to said engine operating state indicative signal for actuating at least one of said throttle valve and said valve element of said E.G.R. control valve in a direction tending to increase the E.G.R. flow rate; and

means responsive to said engine operating state indicative signal for preventing said throttle valve and said valve element of said E.G.R. control valve from being actuated in said direction tending to increase the E.G.R. flow rate until the engine keeps operating in said predetermined state for a time longer than a predetermined time.

4,446,841

PHOTOELECTRIC ISOLATION CIRCUIT FOR AN INTERNAL COMBUSTION ENGINE IGNITION SYSTEM

Howard E. Van Siclen, Jr., Unadilla, N.Y., assignor to The Bendix Corporation

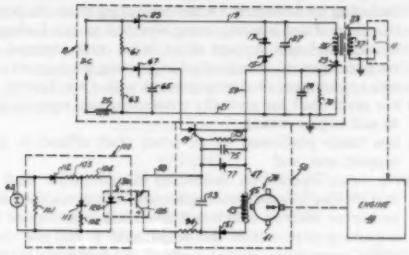
Filed Jan. 20, 1982, Ser. No. 341,030
Int. Cl.³ F02P *5/04*
U.S. Cl. 123—602 **5 Claims**

1. In combination with an internal combustion engine ignition system having at least one spark plug; means for receiving and storing electrical energy including a first solid state electronic switching device for releasing the stored energy when switched; a triggering circuit for switching the first electronic switching device to release the stored energy through said spark plug, said triggering circuit including a second solid state electronic switching device, pulse generating means for generating a succession of electrical trigger pulses in timed relation to the speed of the engine crankshaft for switching the second switching device which switches the first switching device, and means for biasing the second switching device; and means

for automatically controlling the bias means, said bias control means including a single transistor connected in parallel with said biasing means, the improvement wherein:

said transistor is a photosensitive transistor; and

means for operating said transistor in the active region of its



operating characteristics wherein its resistance is not substantially a constant value of resistance, said transistor operating means including at least one light emitting diode adapted to receive an electrical current which is a function of at least one operating parameter of the engine and provide a light output signal to said transistor.

4,446,842

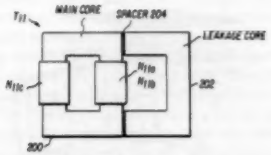
IGNIGNITION SYSTEM

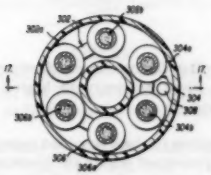
Shinichiro Iwasaki, Troy, Mich., assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Continuation-in-part of Ser. No. 268,889, Jun. 1, 1981, Pat. No. 4,382,430. This application Jun. 1, 1982, Ser. No. 383,607

Int. Cl.³ F02P *3/04*

U.S. Cl. 123—606 **18 Claims**





1. An ignition system for an internal combustion engine having plural cylinders comprising:

timing means coupled to a crankshaft of said engine for sequentially supplying plural timing control signals to a plurality of respective output terminals in synchronism with the rotation of said crankshaft, each of said output timing control signals being associated with a respective cylinder of said engine;

oscillator means for producing an AC output signal;

switch means coupled to said oscillator means for generating an AC drive signal based on said AC output signal, said switch means comprising a leakage transformer having a pair of output terminals across which said AC drive signal is provided;

a plurality of high voltage generator means, each of said generator means being associated with a respective cylinder of said engine, said generator means coupled to respective output terminals of said timing means to receive respective control signals therefrom, each generator means coupled to the output terminals of said leakage transformer and including means for producing a high voltage AC ignition signal when said drive AC signal and a respective timing control signal are simultaneously received; and

a plurality of spark plugs each associated with a respective engine cylinder and each having a pair of electrodes to which a respective of said high voltage AC ignition signals is sequentially applied, whereby ignition arcing is produced across the electrodes of said spark plugs;

wherein after initiation of said arcing current developed across said electrode pair is limited by magnetic flux leakage within said leakage transformer whereby the level of said AC drive signal is correspondingly reduced.

4,446,843

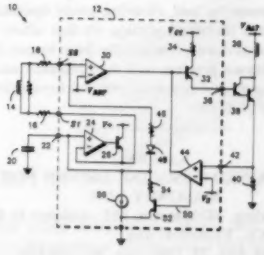
ADAPTIVE DWELL IGNITION SYSTEM

Robert C. Rumbaugh, and Robert B. Jarrett, both of Tempe, Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Oct. 4, 1982, Ser. No. 432,611

Int. Cl.³ F02P *5/00*

U.S. Cl. 123—609 **5 Claims**



5. In an adaptive dwell ignition system for charging and discharging an ignition coil to generate spark to operate an engine including an adaptive dwell capacitor for varying the excess dwell time and an integrated circuit portion responsive to timing signals applied thereto which are superimposed onto the voltage potential developed across the adaptive dwell capacitor, the improvement comprising the integrated circuit portion including first resistive circuit means coupled between a first input of the ignition system and a first circuit node for charging the adaptive dwell capacitor and a second resistive circuit means for discharging the adaptive dwell capacitor during the excess dwell time, said second resistive circuit means being coupled between said circuit node and a terminal at which is supplied a ground reference potential, the ratio between said charging and discharging of said adaptive capacitor being maintained constant at any given engine RPM to thereby maintain the excess dwell time substantially independent of temperature and manufacturing process variations.

4,446,844

PROJECTILE SHOOTING GUIDE FOR BOWS

Jim Z. Nishioka, 1268 Hemlock NW., Salem, Oreg. 97304

Filed Jun. 28, 1982, Ser. No. 392,547

Int. Cl.³ F41B *5/00*

U.S. Cl. 124—41 A **8 Claims**

1. For use with a bow of the type having a bowstring and a

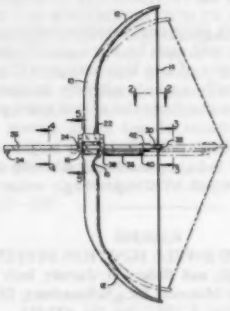
tensioning means connected to the bowstring, a projectile shooting guide comprising

(a) a support for use on a bow,

(b) an elongated guide member for support on a bow by said support,

(c) said guide member including forward and rearward portions and when in an operative position said rearward portion extends rearwardly from said support,

(d) said rearward portion including a pre-draw position and a drawn positon,



(e) means on said rearward portion of said guide member for operatively engaging a bowstring during a rearward drawing movement of said rearward portion,

(f) resilient means on said shooting guide operatively connected to said rearward portion so that when said rearward portion is drawn rearwardly from its pre-draw position to its drawn position and then released said resilient means will urge said rearward portion forwardly towards its pre-draw position.

4,446,845

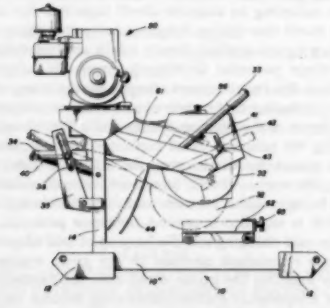
SELF-CONTAINED GASOLINE DRIVEN PORTABLE MASONRY SAW

Edward M. Harding, Middletown, Md., assignor to Equipment Development Co., Frederick, Md.

Filed Aug. 25, 1981, Ser. No. 296,126

Int. Cl.³ B28D *1/04*

U.S. Cl. 125—13 SS **9 Claims**



1. A portable saw for cutting a workpiece comprising:

a base member adapted to be disposed in a first substantially horizontal plane;

a support stand affixed to said base member and projecting upwardly therefrom;

an engine mount affixed to said upwardly projecting support stand and being disposed in a second, fixed substantially horizontal plane displaced upwardly from said first horizontal plane;

an internal combustion engine affixed to said engine mount in a predetermined fixed substantially horizontal disposition and including an output shaft;

a support arm operatively connected to said engine mount and projecting from said support stand, said support arm including an L-shaped bracket projecting from the posterior thereof and a spring being attached to said L-shaped bracket and said support stand in an over-centered arrangement to aid an individual in pivoting the support arm into engagement or disengagement with a workpiece;

a live pivot shaft for pivotally connecting said support arm to said engine mount;

a saw blade positioned on an arbor shaft affixed to said support arm; and

drive means operatively connected to said output shaft of said internal combustion engine, said live pivot shaft and said arbor shaft on which said saw blade is positioned for imparting rotation from said output shaft to said saw blade while permitting relative vertical displacement of said arbor shaft relative to said output shaft;

said support arm being pivotally mounted relative to said engine mount to engage or disengage said saw blade with a workpiece without changing the disposition of said second substantially horizontal plane of said engine mount and said predetermined fixed substantially horizontal disposition of said internal combustion engine affixed thereto.

4,446,846

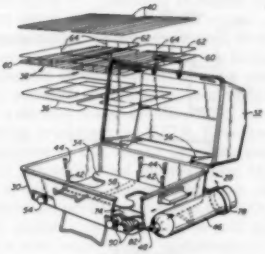
TABLE TOP GRILL

Linus K. Hahn, Palo Alto, Calif., assignor to Columbia Industries Corporation, Palo Alto, Calif.

Filed Nov. 15, 1982, Ser. No. 441,497

Int. Cl.³ A47J *37/00*; **A01J** *11/06*

U.S. Cl. 126—25 R **12 Claims**



1. A table top grill of the type in which objects to be cooked are positioned in close proximity to heated heat retention material, comprising

(a) a housing;

(b) means for heating the heat retention material, the heating means being positioned within the housing;

(c) support means positioned within the housing and directly above the heating means for supporting cooking utensils in direct communication with the heating means;

(d) fire grate means positioned within the housing and above the support means for supporting the heat retention material in direct communication with the heating means including

(i) first tray means removeably positioned above one section of the support means for supporting one portion of the heat retention material; and

(ii) second tray means positioned above the remaining portion of the support means for retaining the remaining part of the heat retention material;

(e) first and second cooking grid means positioned within the

housing and above the fire grate means for providing a cooking surface which is in close proximity to the heat retention material, wherein the first cooking grid means is disposed above the first tray means and the second cooking grid means is disposed above the second tray means and furtherwherein the combination of the first tray means and the first cooking grid means can be removed from the housing independently of the second tray means and second cooking grid means combination so that the cooking surface which is in direct communication with the heating means can be provided simultaneously with the cooking surface which is in close proximity to the heat retention material.

4,446,847

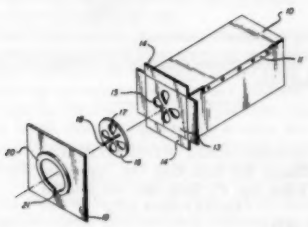
FIREPLACE OUTSIDE AIR INLET

Charles A. Martin, Chisholm Rd., Kingston, N.H. 03848

Filed Apr. 6, 1982, Ser. No. 366,041

Int. Cl.³ F22B 9/02

U.S. Cl. 126—120 **3 Claims**



1. A fireplace inlet comprising: a square conduit having a flange at one end; a face plate affixed at said one end, said face place having a series of apertures within the area defined by the walls of said square conduit and equally radially spaced about the axis of rotation of said face plate; a circular plate of a size to encompass said apertures and lie within said area, said circular plate being mounted for rotation on said face plate and having a series of apertures registering with those of said face place when in alignment and when not in alignment preventing the passage of air through said face plate; a top plate over said circular plate and affixed to said flange, said top plate having a central circular opening therein mating with and accommodating said circular plate and having a lip on the edge of said central circular opening holding said circular plate for rotation; and an outwardly projecting lug affixed to said circular plate to affect rotation thereof by hand or by a poker.

4,446,848

FIREPLACE INSERT CONSTRUCTION

William M. Becker, and William R. Becker, both of Smithville, Mo., assignors to Gladstone Furnace Company, Inc., Kansas City, Mo.

Filed May 9, 1983, Ser. No. 492,558

Int. Cl.³ F24B 7/00

U.S. Cl. 126—121 **12 Claims**

1. A fireplace control and heat exchanging unit adapted to be mounted as an assembled unit into and in front of the fire receiving recess of a preexisting fireplace,

there being, with respect to the structure of the fireplace, per se, a normally substantially horizontal fireplace hearth,

a normally substantially vertical fireplace front wall extending upwardly from said hearth,

a normally substantially rectangular opening in said front wall,

the fire receiving recess received in said front wall opening and surrounded by said front wall, there being normally vertical, opposed side edges in the front wall and a normally horizontal top lintel thereabove defining said opening and the outboard front portion of said recess,

the recess itself normally having an inwardly extending, normally horizontal floor comprising an extension of the hearth, two normally substantially vertical side walls extending inboard from the fireplace front wall side edges at substantial angles thereto, a rear wall and a top wall,

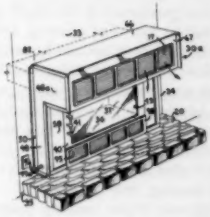
there further being a flue with a damper control therein extending upwardly from at least a portion of the top wall of said recess to carry off smoke and the combustion products of a fire,

said fireplace control and heat exchanging unit comprising, in combination:

(1) a first, substantially rectangular, relatively shallow, vertical, hollow insert housing portion adapted to fairly closely but removably fit into the fireplace front opening and be received within the outboard portion of said fireplace recess in a manner where said first housing portion somewhat congruently fills said opening, as well as the outboardmost portion of said recess,

(2) said first housing portion defined by a rear, inboard wall and bottom, top and side walls connected to one another to make a substantially rectangular insert with an open outboard face,

(3) a second, relatively deeper, largely hollow, substantially rectangular external housing portion fixed to the outboard end of said first housing portion and made integral therewith, said second portion comprising in its lower part a substantial outward extension of the first housing portion and also including an upward extension



thereof rising substantially above said first housing portion lower part whereby, when said first insert housing portion is inserted into the outboard portion of said fireplace recess, the inboard lower part of said second housing portion lies at least substantially adjacent the fireplace front wall side edges and the inboard part of the upward extension thereof approaches and extends upwardly substantially parallel to the lintel overlying said fireplace opening,

(4) said second housing portion having a bottom wall, side walls, a top wall and upper and lower front walls, the said second portion bottom, side and top walls connected, by suitable continuous wall members, with the respective bottom, side and top walls of said first portion,

(5) the first and second housing portions together defining and providing a single, hollow, sealed housing adapted to fit partly within and partly outside said fireplace opening and recess,

(6) flange means provided laterally of the outboard edges of the first housing portion side walls and the inboard edges of the second housing portion side walls operative to overlie in substantial contact the substantial entire height of said front opening side walls, whereby said fireplace recess and front opening are substantially completely closed off, when said insert is in place, by said housing, flange means and the partial upper rear wall of the second housing portion,

(7) a substantially horizontal, substantially central fuel feed and cleanout opening and passageway through said

first and second housing portions defined by a first circumferential wall extending entirely through both of said housing portions, said wall, at its inboard and outboard ends, continuously and circumferentially fixed to the first housing portion rear wall and second housing portion lower front wall, respectively, said opening spaced inwardly away from the bottom, top and side walls of said first and second housing portions,

(8) a door closure for said central opening and passageway on the lower front wall of said second housing portion,

(9) a substantially horizontal lower draft opening and passageway defined by a second circumferential wall extending entirely through said first and second housing portions below said central fuel feed opening and passageway, there being draft control means associated therewith, said second wall fixed to the front housing portion rear wall and second housing portion lower front wall,

(10) an elongate, sealed, monolithic, hollow plenum body defined by top and bottom walls, side walls and a rear wall fixed to the upper rear wall of the first housing portion above the fuel feed and cleanout opening, said plenum body so sized and shaped as to substantially, yet not entirely, block and close off a substantial portion of said fireplace recess under the top wall and flue thereof,

(11) at least two spaced-apart discrete openings through said first housing portion rear wall into said plenum body, one an inlet opening thereinto and the other an outlet opening therefrom,

(12) a blower positioned in the upper part of said housing connected to said first opening and adapted to blow relatively cool air from said housing into said plenum,

(13) a hollow passageway defined by a third circumferential wall positioned in the upper part of said first and second housing portions connected to said first housing portion rear wall around said second opening and adapted to receive therewithin relatively heated air from said plenum body and pass it out of said first and second housing, and

(14) at least one intake opening positioned in the lower part of said second housing portion for receiving air from outside said housing thereinto.

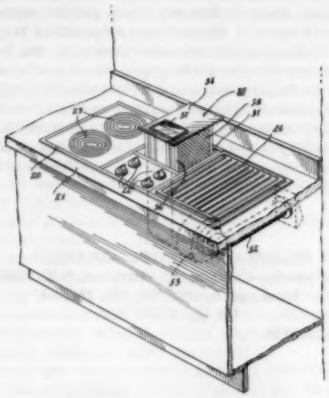
4,446,849

VENT APPARATUS FOR A SURFACE COOKING APPLIANCE

Robert H. McFarland, Mansfield, Ohio, assignor to The Tappan Company, Mansfield, Ohio

Filed Aug. 24, 1981, Ser. No. 295,598
Int. Cl.³ F24C *15/20*
U.S. Cl. 126—299 R **12 Claims**

1. In a ventilating system for a surface cooking appliance having a ventilating duct extending downwardly through a generally horizontal surface adjacent at least one cooking unit, and a ventilator mounted for vertical movement with respect to said duct and having a lowermost position and an uppermost position, the improvement wherein said ventilator has a substantially rectangular horizontal top having a front edge, a pair of opposite side edges, and a rear edge, said top being shaped to cover and substantially seal the upper end of said duct in said lowermost position of said ventilator, vertical support means extending downwardly from said adjacent the front edge of said top for selectively holding said ventilator at said lowermost position and said uppermost position wherein said top is substantially above said surface, said ventilator having a substantially open side extending downwardly from one of said side edges and being substantially completely open between said top and said surface when said ventilator is in said uppermost position, and a flat vertically oriented filter mounted to substantially completely and removably cover said open side of said ventilator and to move vertically with said ventilator,



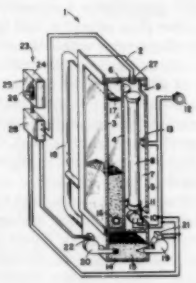
said vertical support means comprising substantially the sole support for said top.

4,446,850

SOLAR PANEL WITH STORAGE

Kenneth P. Zilisch, 606 Cape Cod Ave., Appleton, Wis. 54911

Filed Sep. 17, 1982, Ser. No. 419,323
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—431 **3 Claims**



1. A self contained fully automatic vertical wall panel solar heating system comprising;

(a) at least one wall panel in the shape of an enclosed rectangular box having a broad exterior side and a broad interior side and a substantially enclosed perimeter and the panel has no moving parts, and

(b) the exterior side comprises a first pane of transparent material such as glass and the like and a second pane of transparent material which is substantially coextensive with the first pane of transparent material and spaced apart from the first pane of transparent material so as to form an insulating chamber on the exterior side of the panel,

(c) a back panel which is opaque and substantially coextensive with the panes of transparent materials and spaced apart from the second pane of transparent materials to form a heat chamber,

(d) an array of heat storage elements such as containers of phase change materials such as calcium chloride hexahydrate, eutectic salts and the like positioned in the heat chamber, and

(e) an air entrance passage and an air exit passage passing through the back panel and communicating with the heat chamber so as to permit air from the space to be heated to enter the heat chamber, pass over the array of heat storage elements and be heated thereby, and then to pass through the exit passage into the space to be heated, and

(f) wherein the heat chamber is provided with a temperature activated heat chamber switch and the space to be heated is provided with a temperature actuated room temperature switch, and the heat chamber is provided with an air moving means such as a fan, blower, and the like and the air moving means is interconnected with the heat chamber switch and the room switch so that the air moving means will be actuated when the heat chamber temperature is above a preset temperature and the room temperature is below a preset lower temperature and operation of the air moving means will continue until the temperature in the vicinity of the room temperature switch reaches a preset upper temperature at which time the room temperature switch will act to deactivate the air moving means and the air moving means serves to draw air from the area to be heated into the heat chamber and over the array of heat storage elements and to blow the air heated thereby into the space to be heated, and

(g) wherein the exterior insulating chamber is provided with an insulating particle input port and an insulating particle output port and the insulating partical input port and the insulating particle output port are operably joined to a storage bin filled with insulating particles such as polystyrene beads and the like and the storage bin is provided with a blower means for transferring the insulating particles from the bin to the exterior insulating chamber and a vacuum means for drawing beads from the exterior insulating chamber to the storage bin and the panel is further provided with a solar sampling chamber and the sampling chamber has contained therein a temperature sensing means which serves to actuate a control switch which activates the vacuum means of the bead chamber when the temperature in the sampling chamber reaches a preset upper temperature and thereby serves to remove insulating beads from the insulating chamber and thereby permits solar energy to pass through the insulating chamber into the heat storage chamber and impinge upon the heat storage elements therein and the temperature sensing means in the sampling chamber further serves to actuate a control switch which serves to activate the blower means in the storage bin when the temperature in the sampling chamber reaches a preset lower temperature and thereby acts to fill the insulating chamber with insulating beads and thereby serves to prevent the loss of heat from the heat storage chamber by way of the insulating chamber.

4,446,851

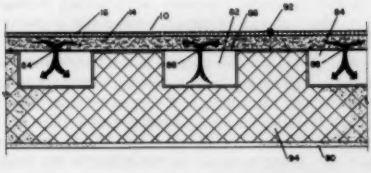
PLASTIC RADIANT EXCHANGER

Ronald D. Grose, Omaha, Nebr., assignor to InterNorth, Inc., Omaha, Nebr.

Continuation-in-part of Ser. No. 168,185, Jul. 10, 1980, abandoned. This application Jun. 1, 1982, Ser. No. 383,790

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—449 **3 Claims**



1. An apparatus for radiant energy exchange having the capacity to absorb radiant energy and reject it to the atmosphere under appropriate conditions, and suitable for use as an outer protective covering, comprising a structure having open supply and return plenums formed as an integral part thereof and a radiant energy exchanger secured thereto, said exchanger comprising:

(a) a relatively thin layer of gas permeable open-celled semi-opaque plastic foam capable of absorbing and rejecting radiant energy and of allowing the passage of a heat transfer fluid therethrough,

(b) a layer of transparent lightweight gas impermeable plastic material, having air spaces disposed therewithin, disposed between the open-celled foam and the atmosphere to prevent loss of heat by convection from the exchanger, said impermeable plastic material being securely adhesively bonded to said foam to prevent separation thereof and heat transfer fluid bypass caused thereby, and

(c) a layer of gas impermeable reflective material which:

(i) forms the outer walls of said plenums of said structure when said exchanger is secured thereto,

(ii) has openings therein spaced to communicate with said plenums to provide more than one relatively short transverse flow path of said heat transfer fluid through said exchanger and to allow controlled ingress to and egress from said foam by said heat transfer fluid, and

(iii) is securely adhesively bonded to said foam opposite said impermeable plastic material to prevent separation thereof and heat transfer fluid bypass caused thereby.

4,446,852

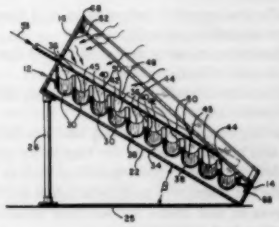
TERRACED SOLAR ENERGY COLLECTOR

William H. Steigelmann, Cherry Hill, N.J., assignor to En-Save, Inc., Cherry Hill, N.J.

Filed Aug. 10, 1981, Ser. No. 291,422

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—432 **9 Claims**



1. A solar heat collector comprising:

A. a plurality of elongated heat-absorbing troughs;

B. support means for supporting said troughs in a generally parallel adjoining side-by-side terraced array, in position to guide a liquid flow to prevent pools of heat-absorbing liquid from forming in the troughs, and with an end of each trough elevated longitudinally and displaced laterally relative to the other end of the trough to permit a continuous liquid flow by gravity toward and out of the respective lower ends thereof;

C. feed means for introducing heat-absorbing liquid into said troughs disposed in said array at the upper ends thereof to permit a flow of the heat-absorbing liquid toward the respective lower ends; and

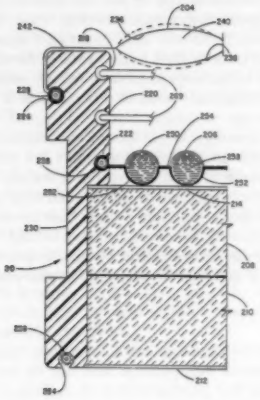
D. collection means for collecting the heat-absorbing liquid from said troughs disposed in said array at the lower ends thereof.

4,446,853

SOLAR COLLECTOR PANEL

Thomas P. Adcock, 300 Meadowbrook Dr., Huntsville, Ala. 35803

Division of Ser. No. 804,022, Jun. 6, 1977, Pat. No. 4,129,177.
This application Dec. 6, 1978, Ser. No. 967,044
Int. Cl.³ F24J 3/02
U.S. Cl. 126—450 2 Claims



1. A solar collector panel comprising:
a. a frame;
b. a top transparent to solar radiation sealingly mounted to said frame, said top being lenticulated and inflatable and comprised of molded thermo-plastic film;
c. an absorber cell mounted to said frame and spaced below said top;
d. a reflective member mounted in said frame and spaced below said absorber cell;
e. an insulation member mounted in said frame and spaced below said reflective member;
f. a bottom cover sealingly mounted to cover the bottom of said frame; and
g. mounting means for mounting said top, said absorber cell and said bottom cover at the respective peripheral edges thereof comprising corresponding lock-in means for engaging the respective peripheral edges and corresponding grooves in said frame for securely retaining said corresponding lock-in means.

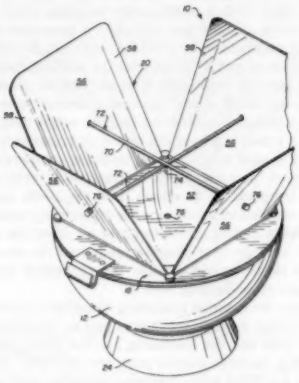
2. A rigid frame of thermal insulating material for surrounding and securing solar collector panel elements in mutually spaced, parallel relation, said frame comprising, fluid inlet and outlet means connected to said frame and communicating with fluid-containing solar collector panel elements, a first surface having a plurality of vertically disposed, mutually spaced horizontal, continuous grooves adapted to receive splined strips and a first elongated, horizontal, continuous recess having a shoulder portion adjacent the vertically disposed, mutually spaced grooves, and, a second surface having a second horizontal, continuous groove adapted to receive a splined strip and a second elongated, horizontal, continuous recess having first and second shoulder portions adapted to receive locking means in engagement therewith, whereby said grooves in said frame, said elongated recesses and said locking means cooperate to secure said frame and said collector panel elements.

4,446,854

SOLAR OVEN

Merton L. Clevett, and Mildred L. Clevett, both of 6121 S. Logan Ct., Littleton, Colo. 80121

Filed Jul. 20, 1981, Ser. No. 285,064
Int. Cl.³ F24J 3/02
U.S. Cl. 126—451 12 Claims



1. A solar powered oven, comprising:
(a) a generally hemispherical oven body assembly having inner and outer hemispherical shells, said inner shell defining an interior supporting surface for, in use, carrying a cooking container, said outer hemispherical shell substantially concentric spaced from said inner shell;
(b) a cover assembly of solar radiation permeable material;
(c) means for releasably attaching said cover assembly to said oven body over the non-hemispheric face thereof;
(d) reflector means for directing solar radiation through said cover assembly;
(e) means for indicating alignment of the oven face with a source of solar radiation; and
(f) further comprising thermally isolating spacer means for separating and spacing said outer hemispheric shells from said inner hemispherical shell and aligning the shells in substantially concentric relationship, wherein said spacer means comprises a plurality of at least three cork bodies located at spaced apart locations between said hemispheric shells.

4,446,855

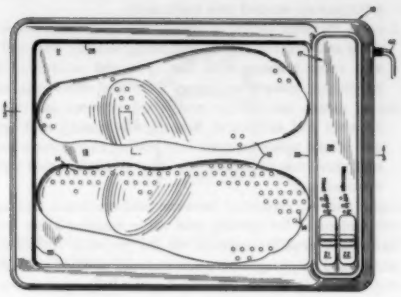
FOOT TREATMENT APPARATUS

Belvin F. Friedson, Miami, Fla., assignor to Windmere Corporation, Hialeah, Fla.

Filed Dec. 31, 1981, Ser. No. 336,430
Int. Cl.³ A61H 29/00, 1/02
U.S. Cl. 128—24.2 10 Claims

1. A foot treatment apparatus for providing massage treatment to the feet, said apparatus comprising: a casing which includes a floor with upwardly extending side walls and a pair of foot receiving stations located in the floor; vibrator means mounted on the casing for transmitting vibrations to said casing, said vibrator including a C-shaped vibrator plate having upper and lower end portions, a power transformer mounted at the upper end portion of said plate with the lower end portion of said plate being mounted on the casing at the level of the floor, and said vibrator being aligned with the longitudinal axis of said casing; and heating means for providing heat directly to said foot receiving station, said heating means including a rope heating element which is mounted in a channel located in the

lower surface of the floor beneath the foot receiving station, said rope heating element extending the length and width of



said foot receiving station in a series of U-shaped or serpentine curves.

4,446,856

ORTHOTIC DEVICE

R. Paul Jordan, Northport, N.Y., assignor to The Langer Biomechanics Group, Inc., Deer Park, N.Y.

Filed Dec. 18, 1981, Ser. No. 331,913
Int. Cl.³ A61F 5/00
U.S. Cl. 128—80 R **28 Claims**

1. An ankle-foot orthosis comprising
means immobilizing the ankle and foot against relative movement,
foot support means connected with said immobilizing means,
said immobilizing means and foot support means being formed to the configuration of the neutral position of maximal subtalor joint contact and relaxed muscle of the ankle and foot of the wearer,
and said foot support having means to support the foot with the metatarsal heads thereof normally out of muscle spasm producing contact with said foot support while the toes of the foot are supported in a position of relaxed muscle.

4,446,857

MEDULLARY NAIL AND PROCESS FOR THE PRODUCTION THEREOF

Wolf-Dieter Otte; Heinz Otte, both of Volkach, Fed. Rep. of Germany; Siegfried Schider, Reutte, and Otto Wiesner, Ruette-Muehl, both of Austria, assignors to Schwarzkopf Development Corporation, New York, N.Y.

PCT No. PCT/US79/00708, 371 Date May 9, 1980, 102(e) Date May 9, 1980, PCT Pub. No. WO80/00533, PCT Pub. Date Apr. 3, 1980
PCT Filed Sep. 4, 1979, Ser. No. 351,105
Claims priority, application Austria, Sep. 4, 1978, 6368/79
Int. Cl.³ A61F 5/04
U.S. Cl. 128—92 BC **3 Claims**

1. A rotation stable medullary nail for fracture fixation having a hollow body provided with a plurality of longitudinal grooves in the outer surface and a cutter at one end; said longitudinal grooves disposed over the total length of said body to the vicinity of said cutter; said hollow body comprised of a composition selected from the group consisting of tantalum, an alloy of tantalum containing more than 50% by weight tantalum, niobium, and an alloy of niobium containing more than 50% by weight niobium, said hollow body having an inner periphery and an outer periphery, said inner periphery being formed by a closed series of contiguously alternating convex and concave segments of which said concave segments are arranged so as to be tangent to an inscribed circle; said outer periphery being formed by a closed series of contiguously alternating convex and concave segments of which said convex segments are arranged to be colinear with a second circle which is larger than and concentric to said inscribed circle; said concave segments of said inner and outer peripheries being substantially aligned so that said hollow body has a substantially uniform radial cross-sectional dimension extending between said inner periphery and said outer periphery; said radial dimension being substantially the same over the entire length of said nail body; said longitudinal grooves having sharp edges formed by the abutments of said concave and convex segments in said outer periphery.

4,446,858

ARM AND SHOULDER BRACE

Allan H. Verter, 684 Franklin Ave., Nutley, N.J. 07110

Filed Jun. 28, 1982, Ser. No. 392,560
Int. Cl.³ A61F 5/40
U.S. Cl. 128—94 **1 Claim**

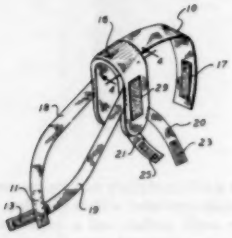
1. An arm and shoulder brace, comprising:
(a) a rigid U-shaped element having a trough portion with first and second leg portions terminating in a substantially spaced parallel relationship, said U-shaped element adapted in size and dimension for placement above the shoulder and adjacent to the base of the neck of a patient, the external surface of said U-shaped element provided with pressure responsive attachment means;
(b) two lateral straps having first ends and second ends each, the first ends permanently secured to said U-shaped element at points near the beginning of each of the leg por-

tions thereof, the second lateral strap ends extending downwardly from the leg portions, and having at the second ends thereof pressure responsive attachments means;

(c) two medial straps having first and second ends each, the first ends permanently secured to said U-shaped element at points approximately half way between the leg portions and the trough of said U-shaped element the second medial strap ends extending laterally outwardly from the trough portion, and the second ends thereof being provided with pressure responsive attachment means;

(d) a surgical bicep band having dimensions suitable for encirclement of the upper bicep, said surgical band having a first end and a second end, and at both ends and on both sides thereof, having pressure responsive attachments means;

(e) a deltoid strap having a first end and a second end, said deltoid strap permanently secured at one end to the trough of the rigid U-shaped element and extending downwardly therefrom, and the other end of the deltoid strap provided



with pressure responsive attachment means adapted for securement to the bicep band side pressure responsive attachment means; and

(f) a sling having a first end and a second end, each of said ends provided with pressure responsive attachments means, and each said pressure responsive attachment adapted for connection to the pressure responsive attachment means upon the exterior of the U-shaped element,

whereby the muscles and ligaments of a patient may be supported by encircling the upper bicep with said bicep band and securing said bicep band to the U-shaped element by means of said deltoid strap, through the connection of said deltoid strap to the upper bicep band using said pressure responsive attachment means of the respective bicep band and deltoid strap in order to facilitate effective adjustment of the bicep band and deltoid strap to provide suitable pressures by the respective bicep band and deltoid strap against the injured muscles or ligaments of the shoulder area, and further whereby, said medial and lateral straps may be secured under the armpits of the user, this providing lateral stability to the U-shaped element of the brace.

4,446,859

BREATHING APPARATUS

Vernon G. Pedersen, Chicago, Ill., assignor to Dacor Corporation, Northfield, Ill.

Filed Jul. 6, 1981, Ser. No. 280,371

Int. Cl.³ B63C *11/16*; A62B *7/04*

U.S. Cl. 128—204.26 **4 Claims**

1. In a pressure regulator for breathing apparatus, comprising in combination

a regulator housing having a recess therein,

a diaphram mounted across said recess to define a chamber in said housing,

a breathing tube opening into said chamber,

an air inlet valve mounted to said housing and having an air inlet port for connection to a source of compressed air, said air inlet valve including:

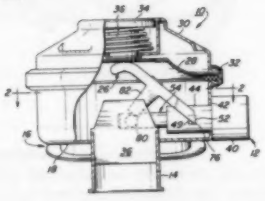
a tubular valve housing,

a valve seat disposed in said housing in communication with said air inlet port, said air inlet port including a passageway around said valve seat;

a valve member having a tubular side wall with one end open and one end closed and being slidably disposed in said valve housing with the open end positioned for movement toward and away from said valve seat, and

spring means operatively positioned between said valve member and said valve housing for biasing said open end of said valve member into sealing engagement with said valve seat to prevent the flow of air into said valve member, and

actuator means connected between said diaphram and said valve member for moving said valve member away from said valve seat in response to the pressure differential across said diaphragm between a closed position in sealing engagement with said valve seat and a fully open position spaced a substantial distance from said seat whereby gas passes from said air inlet passageway into said tubular valve member,



the closed end of said valve member extending into said chamber from said valve housing and having an air outlet orifice in a portion of the tubular side wall of said valve member located exteriorly of said valve housing, whereby air is directly emitted from said orifice into said chamber,

said air inlet valve being positioned in said regulator housing such that air emitted from said orifice is at least partially directed across said chamber into said breathing tube, and deflector means attached to said actuator means for movement in response to movement of said actuator and thereby, with respect to said valve member, from a first position in which said air inlet valve is normally closed to a second position in which said air valve is partially opened and said deflector is between said orifice and said breathing tube wherein a portion of said stream of air is deflected away from said breathing tube and to a third position in which said inlet valve is fully opened and said deflector is positioned such that a lesser portion of said stream of air is deflected away from said breathing tube.

4,446,860

DEVICES AND METHODS FOR THE PREVENTION OF TRANSMISSION OF VENEREAL DISEASE AND NON-GONOCOCCAL GENITAL INFECTIONS

Morton Gutnick, 8329 Fairview Rd., Elkins Park, Pa. 19117

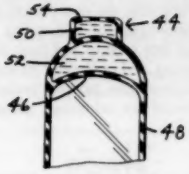
Division of Ser. No. 137,306, Apr. 4, 1980, Pat. No. 4,332,243. This application May 20, 1982, Ser. No. 380,267

Int. Cl.³ A61F *13/00*

U.S. Cl. 128—132 R **2 Claims**

1. A method of treating and preventing venereal disease and providing birth control which comprises incorporating with a mechanical birth control device a venereal preventing medication, encapsulating said medication in a non-dissolvable me-

chanical wall of said mechanical birth control device, and causing rupture of said wall and release of said medication by



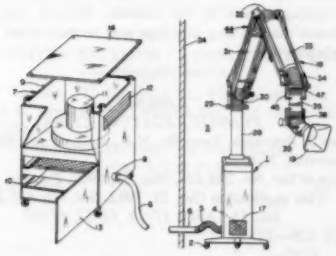
the mechanical pressure developed during intercourse to protect the participants.

4,446,861

METHOD AND APPARATUS FOR PURIFYING CONTAMINATION OF DENTAL CONSULTATION ROOM

Yoshikazu Tada, Tokyo, Japan, assignor to Hayashikane Shipbuilding & Engineering Co., Ltd., Yamaguchi, Japan, a part interest

Filed Aug. 16, 1982, Ser. No. 408,568
Claims priority, application Japan, Sep. 4, 1981, 56-138535
Int. Cl.³ A62B *7/02*; A61C *19/00*
U.S. Cl. 128—139 **6 Claims**



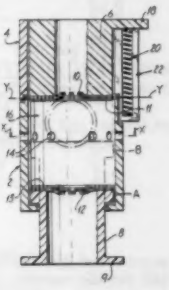
3. An apparatus for purifying the contamination of a dental consultation room comprising: a suction/dust collector adapted to be installed outside said dental consultation room; a stand having a duct adapted to be installed inside said consultation room and communicated with said suction/dust collector by means of said duct; an opening proximate the bottom of said stand for sucking anesthetic gas and dust; a duct member in communication with said duct; a suction hood for sucking anesthetic gas and dust from outside the oral cavity of a patient, communicating with said stand by means of said duct member; and means for selectively controlling the communication of said suction hood and said opening of said stand with said suction/dust collector.

4,446,862

BREATH ACTUATED DEVICES FOR ADMINISTERING POWDERED MEDICAMENTS

Eric A. Baum; Leslie J. Davies, both c/o Minnesota 3M Research Limited, The Pinnacles, Harlow, Essex, England (CM19 5AE); William F. Kirk, 1 Morley St., Loughborough, Leicestershire, and Anthony C. L. Wass, The Mousehole, Duddington Stamford, Lincolnshire, both of England

PCT No. PCT/GB80/00187, 371 Date Jun. 29, 1981, 102(e) Date Jun. 29, 1981, PCT Pub. No. WO81/01243, PCT Pub. Date May 14, 1981
PCT Filed Oct. 30, 1980, Ser. No. 279,977
Claims priority, application United Kingdom, Oct. 30, 1979, 7937519
Int. Cl.³ A61M *15/06*
U.S. Cl. 128—203.15 **13 Claims**



1. A breath actuated device for the oral inhalation by a person of medicaments in finely divided powder form from within a capsule comprising a base component having a cavity containing the powder and a rim defining an outlet aperture communicating with the cavity, and a lid component releasably engaging said base component over said outlet aperture, said device comprising:

wall members defining a chamber, having at least one inlet port for the entry of air into said chamber, and a mouthpiece having a through outlet in direct communication with said chamber, said inlet port, mouthpiece and outlet opening being aligned to provide airflow in a single generally horizontal plane through said inlet port chamber and outlet when the device is positioned normally for operation by inhalation of the person through the mouthpiece;

means positioned adjacent the chamber for supporting the base component of a said capsule containing the powder within the chamber with the rim of the base component uppermost, generally horizontal, and in the plane of the airflow through said inlet port, chamber, and outlet when the device is positioned normally for operation by inhalation of the person through the mouthpiece, and

means adapted for manual activation for removing the lid component of a said capsule having its base component in said means for supporting.

4,446,863

CONNECTOR FOR INHALATION THERAPY APPARATUS

Howard Rubin, 1937 Nester St., Philadelphia, Pa. 19115, and Brent Weinerman, 897 Bridge St., Philadelphia, Pa. 19124

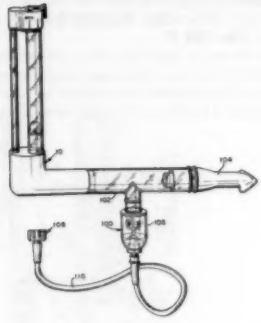
Division of Ser. No. 369,174, Apr. 16, 1982, which is a continuation-in-part of Ser. No. 363,793, Mar. 31, 1982. This application May 20, 1982, Ser. No. 380,242
Int. Cl.³ F16L *11/12*
U.S. Cl. 128—204.18 **7 Claims**

1. A connector for use with threaded or push-on outlet couplings of pressurized gas supplies, the former having an

exteriorly threaded cylindrical pipe termination and the latter having a tapering pipe termination, the connector comprising:

a resilient tubular member, having a flat annular flange at one end, means for receiving a tube at the other end, and a narrower section therebetween having a concave longitudinal cross-section, said one end also having means for receiving a push-on coupling therein; and,

a cylindrical cap member having an internally threaded bore for engaging a threaded outlet coupling and an inwardly projecting annular shoulder at one end thereof, said tubular member being mounted within said threaded bore such that said flange is pressed into a sealing position between



the cap member and the threaded coupling and said other end of said tubular member extends externally of said threaded bore, the annular shoulder defining a second bore enabling the cap member to be slidably mounted on the tubular member and retained in the narrower section and the annular shoulder having an inwardly directed circular edge for pressing a portion of the narrower section of said tubular member into a sealing position between said edge and a push-on coupling after said coupling has been pushed into the one end of the tubular member, whereby the connector may be used with both threaded and push-on couplings.

4,446,864

EMERGENCY VENTILATION TUBE

Robert L. Watson, 14312 Piccadilly Rd., Silver Spring, Md. 20906, and Robert L. Rayburn, 495 North Hills Dr., Salt Lake City, Utah 84103

Continuation-in-part of Ser. No. 168,193, Jul. 10, 1980, abandoned. This application Jul. 7, 1981, Ser. No. 281,066

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—207.14 **14 Claims**

5. A combined pharyngeal airway and esophageal tube apparatus, comprising

a standard face mask of a type which covers both the nasal passages and mouth of a patient and closely fits the patient's face and which has a central opening;

a first, inner tube dimensioned to be received in a patient's esophagus and to extend from a first end adjacent the lower esophagus to a second end adjacent a location outside of the mouth;

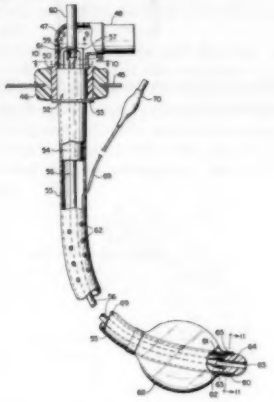
a second, outer tube having an inner diameter larger than the outer diameter of said first tube, said second tube substantially concentrically surrounding a portion of said first tube along the entire length of said second tube and being dimensioned to extend from a first end located adjacent the patient's mouth to a second end located at an inner location adjacent the inner end of said inner tube,

said second tube terminating with the interior thereof being joined to the exterior of said first tube at said inner location, that portion of said first inner tube within said second, outer tube normally being of a small diameter to maximize the volume between said tubes and being distensible and collapsible to permit passage of a nasogastric tube larger than said first tube therethrough;

an expandable and collapsible occluding means surrounding said second tube near the end thereof to be positioned in the lower esophagus for preventing passage of fluids outside of said first tube to and from the stomach;

means for actuating said occluding means;

means in said second tube defining radial passages through the walls thereof for admitting gas into the laryngeal region; and



coupling means for mounting said tubes in said central opening of said face mask, said coupling means having first and second open ends and a chamber therein fluidly connecting said first and second open ends, said first open end of said coupling means being connected to said first end of said second tube, said second open end of said coupling means including a laterally opening ventilating port connectable to a ventilating gas source for conducting ventilating gas to the interior of said second tube, said first tube extending into said chamber and through a sidewall of said coupling means to the exterior thereof, said coupling means maintaining said first and second tubes in coaxial relationship.

4,446,865

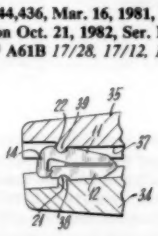
PLASTIC LIGATING CLIPS

Stephen J. Jewusiak, Denville, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Division of Ser. No. 244,436, Mar. 16, 1981, Pat. No. 4,424,810. This application Oct. 21, 1982, Ser. No. 435,869

Int. Cl.³ A61B *17/28, 17/12, 17/00*

U.S. Cl. 128—321 **3 Claims**



1. A ligating clip applying instrument comprising a pair of handles pivoted about a hinge point and extending beyond the hinge point to form a pair of clip closing jaws having opposing inner faces, each of said jaws having a recessed clip-receiving

channel in the inner face thereof extending from the forward tip of said jaw rearward toward said hinge point, said channel having a length at least equal to the length of the clip to be applied by said instrument, each channel having an abutment across the base thereof spaced from the tip of said jaw, said abutment being a raised area extending across the width of the jaw and having a generally convex semi-cylindrical shape with the axis of the cylinder extending across said jaw, the depth of the channel forward of said abutment being greater than to the rear of said abutment.

4,446,866

MICROSURGICAL NEEDLE HOLDER

John A. Davison, San Jose, Calif., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 10, 1982, Ser. No. 356,676
Int. Cl.³ A61B *17/04, 17/28*
U.S. Cl. 128—340 **14 Claims**

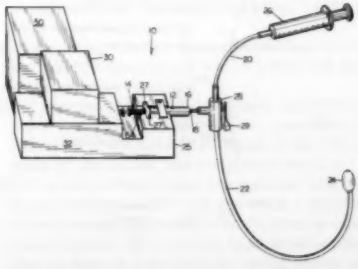
1. A microsurgical needle holder comprising,
a. a pair of arms pivotally mounted to each other intermediate their ends,
b. opposed handles on the proximal ends of each of the arms on one side of the pivot,
c. opposed jaws on the distal ends of each of the arms on the other side of the pivot,
d. opposed flat textured surfaces on each of the jaws, said textured surfaces being substantially engageable to each other in clamping relationship when the handles are drawn together,
e. at least one of said handles having an attachable first handle extension for increasing the length of said handle to be held within the palm while the other handle is being manipulated by the thumb and a finger of the microsurgeon, and
f. at least one weight positionably engageable with said first handle extension for varying the center of balance of said microsurgical needle holder.

4,446,867

FLUID-DRIVEN BALLOON CATHETER FOR INTIMA FRACTURE

Robert F. Leveen, 312 Lombard St., Philadelphia, Pa. 19147, and Eric G. Leveen, 85-27 Hearth Dr. - #3 Condo, Houston, Tex. 77054

Filed Dec. 31, 1981, Ser. No. 336,085
Int. Cl.³ A61M *29/02*
U.S. Cl. 128—344 **11 Claims**



8. An apparatus for treatment of atherosclerotic occlusions comprising, in combination: a catheter, said catheter defining a proximal end, a distal end, and a through-going lumen, a supply syringe, said supply syringe being connected to said distal end and being adapted to supply fluid through said lumen, a balloon mounted to said proximal end of said catheter, said balloon being adapted to be inflated by fluid from said supply syringe through said lumen; and a pulse generator, said pulse generator including a pulse syringe, said pulse syringe being coupled to said catheter adjacent said distal end and being adapted to supply pressure pulses in fluid contained in said lumen, and a pulse motor adapted to create pressure pulses in said pulse syringe, said pulse motor including a ram aligned with said pulse syringe and adapted to strike said pulse syringe, a spring adjacent said ram opposite said pulse syringe, a cam rotor positioned adjacent said ram adapted to alternately drive said ram against said spring to compress said spring and then release said ram, and a rotary motor adapted to rotate said cam rotor.

4,446,868

CARDIAC ARRHYTHMIA ANALYSIS SYSTEM

Alfred L. Aronson, 6024 SW. Jean Rd., Lake Oswego, Oreg. 97034

Filed May 24, 1982, Ser. No. 381,540
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—708 **6 Claims**

1. A system for identifying a QRS complex in an electro-cardiac signal representative of cardiac electrical activity, comprising:
(a) differentiator means, responsive to said electro-cardiac signal, for producing the derivative thereof;
(b) rectifying and filtering means, responsive to said electro-cardiac signal, for producing a signal representative of the low-pass filtered absolute value of said electro-cardiac signal;
(c) first comparator means, responsive to the derivative of said electro-cardiac signal and to said low-pass filtered absolute value signal, for producing a resultant signal when the total of a predetermined reference level less the sum of said derivative and said low-pass filtered absolute value signal is greater than zero; and
(d) output means, responsive to said resultant signal and to said low-pass filtered absolute value signal, for producing an output signal representative of the occurrence of a QRS complex upon the occurrence of said resultant signal when the amplitude of said low-pass filtered absolute value signal exceeds a predetermined threshold level.

4,446,869

WATER ABSORBING TRAP TO PROTECT AN INFRARED EXHALED CARBON DIOXIDE APNEA MONITOR OF A PATIENT'S RESPIRATION

Daniel W. Knodle, Seattle, Wash., assignor to Trimed, Inc., Bellevue, Wash.

Filed Mar. 7, 1983, Ser. No. 472,722
Int. Cl.³ A61B *5/08;* A61M *16/00*
U.S. Cl. 128—716 **20 Claims**

1. A water trap in combination with a cannula means having a substantially constant pre-selected internal diameter communicating moisture laden patient exhalations to an analyzer, comprising:
(a) a body having a recess with a diameter in excess of said pre-selected diameter and with a pre-selected volume;

(b) inlet adaptor means connected to said body and including an aperture in fluid communication with said recess;
(c) said cannula means having a first end adapted to receive patient exhalations and a second end, said inlet adaptor means secured to said second end of said cannula means and for maintaining said second end internal diameter constant while secured;
(d) said aperture coaxial with said second end when secured to said inlet adaptor means and having a diameter equal to said pre-selected diameter;
(e) water absorbent means disposed in said recess and including an aperture therethrough coaxial with said inlet adaptor means aperture and having a diameter equal to said pre-selected diameter;

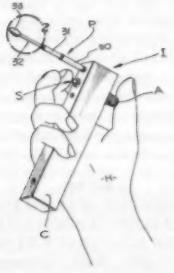
(f) said water absorbent means having a volume substantially equal to said pre-selected volume and adapted for drying exhalations;
(g) exit means connected to said body and including an aperture coaxial with and in fluid communication with said water absorbent means aperture; and,
(h) an analyzer connected to said exit means, said exit means adapted for communicating dryed exhalations from said body to said analyzer.

4,446,870

ELECTRICAL TREATMENT METHOD

Thomas W. Wing, 380 E. Baseline Rd., Claremont, Calif. 91711

Continuation-in-part of Ser. No. 887,003, Mar. 16, 1978, Pat. No. 4,180,079. This application Jun. 1, 1979, Ser. No. 44,544
Int. Cl.³ A61H *39/00*; A61N *1/36*
U.S. Cl. 128—422 **3 Claims**



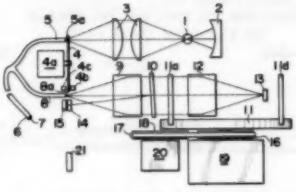
1. The method of electrically stimulating the body of a living person comprising the steps of:
generating a first square-wave voltage signal of several volts amplitude and having a period of about four seconds;
generating a second square-wave voltage signal having a higher frequency and smaller amplitude than said first signal;
combining said two signals to provide a composite signal; and
then applying said composite signal to the body of a living person.

4,446,871

OPTICAL ANALYZER FOR MEASURING A CONSTRUCTION RATIO BETWEEN COMPONENTS IN THE LIVING TISSUE

Kenji Imura, Osaka, Japan, assignor to Minolta Kabushiki Kaisha, Osaka, Japan

Filed Dec. 15, 1980, Ser. No. 216,526
Claims priority, application Japan, Jan. 25, 1980, 55-8070
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—633 **12 Claims**



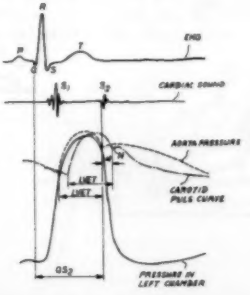
1. An oximeter for obtaining information indicative of the level of hemoglobin oxide in living tissue, comprising:
a source of light having a plurality of different wavelengths susceptible of coaction with both hemoglobin and hemoglobin oxide;
means for directing the light at the subject tissue;
means for measuring the degree of light absorption at a predetermined standard wavelength;
means for finding a second wavelength in which the degree of absorption is equal to that at the predetermined standard wavelength; and means for determining the level of oxygen saturation in the blood from the second wavelength.

4,446,872

METHOD AND APPARATUS FOR DETERMINING SYSTOLIC TIME INTERVALS

Hermann J. Marsoner, and Günther Savora, both of Graz, Austria, assignors to AVL AG, Schaffhausen, Switzerland

Filed Aug. 29, 1978, Ser. No. 937,886
Claims priority, application Switzerland, Sep. 8, 1977, 11030/77
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—700 **5 Claims**



1. An apparatus for determining systolic time intervals from an electrocardiogram, the heart sound and the pluse pressure curve of a patient, comprising:

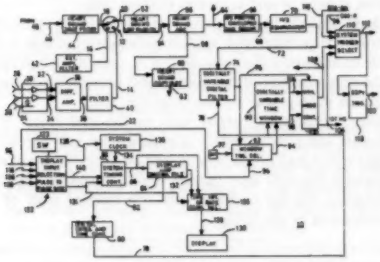
analogue signal processing means for electrocardiogram signals;
analogue signal processing means for heart sound signals;
analogue signal processing means for pulse pressure signals; and
process control means containing a computer means and display device;
each analogue signal processing means having a respective output connected to said computer means;
said analogue processing means for electrocardiogram signals having a second output connected to an amplitude and trigger control input of said analogue signal processing means for heart sound signals and having a third output connected to an amplitude control input of said analogue signal processing means for pulse pressure signals.

4,446,873

METHOD AND APPARATUS FOR DETECTING HEART SOUNDS

Mark W. Groch, Elk Grove, and James R. Domnanovich, Roselle, both of Ill., assignors to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed Mar. 6, 1981, Ser. No. 241,388
Int. Cl.[3] A61B 5/04
U.S. Cl. 128—715 6 Claims



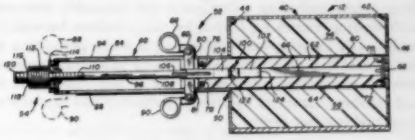
1. A method of detecting heart sounds from a heart sound signal input, comprising the step of:
(a) detecting the occurrence of a first occurring heart sound;
(b) establishing a predetermined heart sound enable window time after the occurrence of said first occuring heart sound;
(c) setting the enable window time for a first detection cycle to approximately the diastolic interval for the maximum heart rate to be detected;
(d) determining whether or not a second heart sound following said first heart sound occurs within said heart sound enable window time; and
(e1) if a second heart sound has already occurred within said heart sound enable window time, providing an output indication of a systole heart sound at the time of occurrence of said second occurring heart sound or
(e2) if no second heart sound has occurred within said heart sound enable window time, providing a signal at the end of said heart sound enable window time for repeating the measurement with increasing heart sound enable window times as long as a second heart sound occurs within said heart sound enable window time and then providing an output indication of a systole heart sound at the time of occurrence of said second heart sound.

4,446,874

MICROWAVE APPLICATOR WITH DISCOUPLED INPUT COUPLING AND FREQUENCY TUNING FUNCTIONS

Victor A. Vaguine, Dallas, Tex., assignor to Clini-Therm Corporation, Dallas, Tex.

Filed Dec. 30, 1981, Ser. No. 335,631
Int. Cl.[3] A61N 5/02
U.S. Cl. 128—804 44 Claims



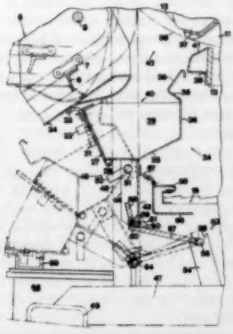
1. A microwave applicator for use in a microwave hyperthermia systems which includes a microwave generator for producing microwave electromagnetic energy and a means for determining the microwave power reflected from a treatment area, comprising:
a hollow core metal waveguide having an open end and a closed end, whereby microwave electromagnetic energy is propagated in the direction from the closed end to the open end of said waveguide,
input power coupling means for coupling said waveguide to the microwave generator of the hyperthermia system, said input power coupling means including means for tuning the coupling of said microwave electromagnetic energy from the microwave generator to said waveguide; and
frequency tuning means for tuning the frequency of said waveguide, said frequency tuning means being discoupled from said means for tuning the coupling of said microwave electromagnetic energy, whereby the reflected power from the applictor is minimized by separately tuning said frequency tuning means and said means for tuning the coupling of said microwave electromagnetic energy.

4,446,875

STONE TRAP FOR COMBINE HARVESTERS

Walter V. Deleu, Torhout, Belgium, assignor to Sperry Corporation, New Holland, Pa.

Filed Jun. 9, 1983, Ser. No. 502,854
Claims priority, application United Kingdom, Jun. 15, 1982, 8217278
Int. Cl.[3] A01F 12/20; A01D 75/18
U.S. Cl. 130—27 JT 19 Claims



1. A combine harvester comprising a threshing mechanism for threshing crop material, a crop elevator operatively associated with said threshing mechanism to feed crop material

thereto, and a removable stone trap located between the crop elevator and the threshing mechanism and having an inlet disposed generally at the transition between the crop elevator and the threshing mechanism, the stone trap being pivotally supported in an operative position by first releasable pivot means and being retained in the operative position by latch means, the arrangement being such that on release of the latch means the stone trap can pivot forwardly of the machine about the first pivot means while still being supported by the first pivot means and retained on said combine harvester, said first pivot means including a first pivot pin releasably cooperable with bearing means supported by said combine harvester for positionally locating said first pivot pin while permitting rotation of said first pivot pin, such that said stone trap is pivotally movable about said pivot means and is also removable from said combine harvester by disengagement of said first pivot pin from said bearing means.

4,446,876

TOBACCO METERING AND FEEDING SYSTEM

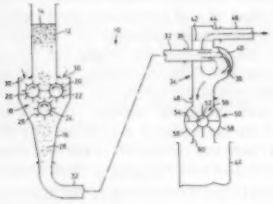
Warren A. Brackman, Cocksville, Canada, assignor to Rothmans of Pall Mall Canada Limited, Don Mills, Canada

Division of Ser. No. 168,505, Jul. 14, 1980. This application Jun. 15, 1983, Ser. No. 493,168

Claims priority, application United Kingdom, Jul. 10, 1979, 7923990

Int. Cl.³ A24B *3/06*

U.S. Cl. 131—110 **6 Claims**



1. Apparatus for conveying tobacco, which comprises:

(a) tobacco reservoir means at a first location and containing tobacco, said tobacco reservoir means comprising an upright elongate tube open at the top for receiving cut tobacco therein and open at the bottom for discharging said cut tobacco therefrom;

(b) tobacco opening and metering means communicating with said tobacco reservoir means at said first location for opening and metering tobacco therefrom, said tobacco opening and metering means including a set of roller elements arranged for rotation about parallel axes, said set of rollers including an upper pair of horizontally-spaced rollers positioned to meter tobacco received from the open bottom end of said elongate tube and a lower roller positioned equidistantly from the axes of said pair of rollers and to open tobacco metered by said pair of rollers;

(c) tobacco conveying conduit means extending from said first location to a second location remote from said first location and positioned to receive said opened and metered tobacco from said tobacco opening and metering means and to convey the same to said second location;

(d) vacuum-inducing means communicating with said tobacco conveying conduit means for drawing air through said conveying conduit means from said first location to said second location, whereby said drawn air acts as the conveying medium for said tobacco through said conveying conduit means;

(e) tobacco-air separating means at said second location for separating said drawn air from said conveyed tobacco; and

(f) rotary tobacco discharge means at said second location for discharging said separated tobacco from said second location.

4,446,877

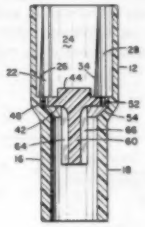
CIGARETTE HOLDER WITH FILTERING ACTION

Leslie N. Aikman, 3628 Ocean Blvd., Corona Del Mar, Calif. 92625

Filed Oct. 5, 1981, Ser. No. 308,464

Int. Cl.³ A24F *5/04;* **A24D** *3/04*

U.S. Cl. 131—198 R **1 Claim**



1. A filter for cigarette smoke in the form of a cigarette holder having a cigarette holding end and an outlet end and a collecting means for collecting tar and nicotine products within the holder intermediate said ends, characterized in that at least one air passageway is formed in the interior wall of the holder at the cigarette holding end which is capable of conducting air past a cigarette to the collecting means when the cigarette is held in said cigarette holding end;

at least one rib being formed on the interior wall of the holder in parallel with said air passageway which is capable of indenting the outer wall of a cigarette, when held in the cigarette end of the holder, and preventing closure of the air passageway by the cigarette; and

further including a barrier wall in the midregion of the holder and a tar collector extending from said barrier into said outlet end of the holder, and an accelerating opening formed through said barrier which opens to the space between the tar collector and the interior wall of said outlet end of the holder.

4,446,878

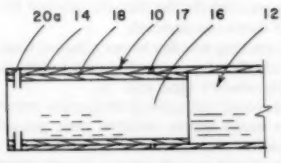
CIGARETTE FILTER

Harry S. Porenski, Jr., Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Sep. 21, 1981, Ser. No. 303,737

Int. Cl.³ A24B *3/04*

U.S. Cl. 131—336 **3 Claims**



1. A filter for a cigarette comprising:

a porous filter rod of cylindrical configuration having opposed inlet and outer ends;

a filter rod wrapper extending longitudinally of and circumscribing the rod leaving the opposed ends in flow through communication;

tipping paper circumscribing said filter rod wrapper;

ventilating air means in said filter rod wrapper and said

tipping paper to provide ventilating air to said filter element; and,

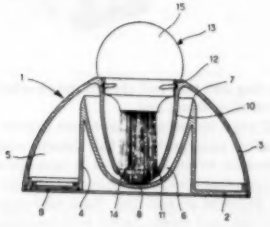
a plurality of apertures circumambiently arranged around the outlet end and adjacent thereto for directing the smoke from the filter in a lateral direction, said apertures being longitudinally spaced from said ventilating air means.

4,446,879

RECEPTACLE FOR MAKE UP POWDER

Jean-Louis H. Gueret, Paris, France, assignor to L'Oreal, Paris, France

Filed Sep. 8, 1982, Ser. No. 415,934
Claims priority, application France, Sep. 25, 1981, 81 18090
Int. Cl.³ A45D *33/00*
U.S. Cl. 132—82 B **10 Claims**



1. A make-up powder receptacle for containing powder substantially in a fluid state, comprising:

(a) a housing having a top and a bottom;

(b) an internal partition which divides said housing into first and second compartments;

(c) passage means intercommunicating said first and second compartments, said partition having a free edge adjacent a part of said housing and said passage means being arranged between said free edge of the partition and said part of the housing, said free edge of the partition being remote from said bottom of the housing;

said first compartment having a bottom portion remote from said free edge and wall means extending from said top of said housing, said wall means and said internal partition defining a pathway therebetween with said pathway extending from said free edge to a point adjacent but spaced from said bottom portion of said first compartment;

(d) said wall means defining a duct in said first compartment for the take-up of the make-up powder by an applicator.

4,446,880

MAKE-UP BRUSH

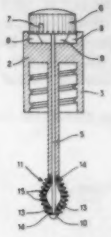
Jean-Louis H. Gueret, and Jean-Pierre Arraudeau, both of Paris, France, assignors to L'Oreal, Paris, France

Filed May 21, 1982, Ser. No. 380,904
Claims priority, application France, May 27, 1981, 81 10586
Int. Cl.³ A45D *40/30*
U.S. Cl. 132—88.5 **11 Claims**

1. In a make-up brush having a longitudinal axis and comprising:

(a) shaft means; and

(b) brush means having first and second ends and including means regularly distributed around said longitudinal axis of the brush to serve as bristles; the improvement comprising



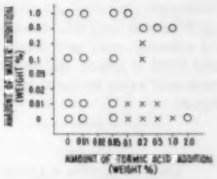
(c) means actuable by a user of the make-up brush for varying the brush diameter at least locally at said regularly distributed means thereof.

4,446,881

METHOD FOR PRESSURE TRANSPORT OF METHANOL THROUGH A PIPELINE

Yasuo Kitamura, Chiba; Masao Suzuki, Tokyo; Toshio Kubota, Ebina; Hiroshi Watanabe, Zushi, and Masaaki Tsujimoto, Funabashi, all of Japan, assignors to Toyo Engineering Corporation, Tokyo, Japan

Filed Aug. 19, 1982, Ser. No. 409,470
Claims priority, application Japan, Aug. 28, 1981, 56-134198
Int. Cl.³ C23F *15/00*
U.S. Cl. 137—1 **6 Claims**



1. In a method for the long-distance pressure transport of a liquid comprised primarily of methanol and optionally containing water, formic acid and one or more organic compounds through a pipeline installation wherein the portions of said pipeline installation in contact with said liquid consist principally of low carbon steel and/or low alloy steel the sum of whose metallic components other than Fe is up to 5 wt. %, the improvement which comprises: the water content of said liquid is limited (1) to the range of 0 to 35 wt. % if the content of formate radicals in said liquid is up to 0.05 wt. %, (2) to the range of 0.25 to 35 wt. % if the content of formate radicals in said liquid is in the range of 0.05 to 2 wt. %, and (3) to the range of 0 to 35 wt. % if the content of the formate radicals in said liquid is in the range of 2 to 3 wt. %, so that said liquid is pressure-transported while the volume ratio of the formate radicals to the water content is maintained at a ratio that does not permit the presence of more than 3 wt. % of formate radicals in said liquid.

4,446,882

SOLENOID-OPERATED VALVE MEANS FOR HYDRAULIC SYSTEMS

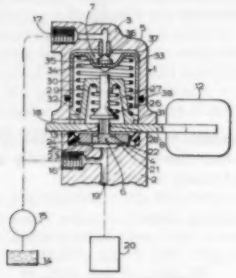
Anthony W. Harrison, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Oct. 20, 1981, Ser. No. 313,216

Claims priority, application United Kingdom, Nov. 1, 1980, 8035193

Int. Cl.³ F16K *31/04*

U.S. Cl. 137—115 **8 Claims**



1. A solenoid-operated valve means for an hydraulic system, said system including at least one reservoir for fluid, a continuously-driven pump, and a part to which fluid under pressure is delivered, said solenoid-operated valve means being operative to control delivery of fluid under pressure to said part by controlling flow of fluid circulated by operation of said pump from said reservoir or one said reservoir through said solenoid-operated valve means and back to said reservoir or a different one of said reservoirs, said solenoid-operated valve means comprising a valve operated by a solenoid, said valve being urged open, energisation of said solenoid being operable to close said valve to cut off said return fluid flow to said reservoir, whereby said pump generates pressure fluid for delivery to the part of said system, said valve then also being operated in response to the pressure generated by said pump, and a valve-opening means responsive to said pump pressure, such that when said pump pressure rises above a first threshold level said pump pressure acts to keep said valve closed regardless of the state of said solenoid, until said pump pressure reaches a second threshold level at which said valve-opening means is operative to cause said valve to open, provided that said solenoid is de-energised.

4,446,883

END LOADED VALVE

Herman L. Paul, Jr., Lebanon, Pa., assignor to Continental Disc Corporation, Kansas City, Mo.

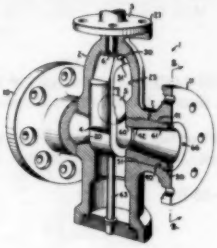
Filed Nov. 22, 1982, Ser. No. 443,447

Int. Cl.³ F16K *43/00*

U.S. Cl. 137—315 **10 Claims**

1. In a ball valve comprising a valve body having therein a fluid flow channel and a valve ball having a closed position associated therewith wherein flow of fluid through said flow channel is blocked by sealing engagement of the ball with a seat ring circumscribing an outlet portion of the flow channel and a plurality of open positions wherein fluid is allowed to flow through the flow channel; the ball being removably retained within a ball cage mounted within the valve body to reciprocate generally perpendicularly relative to said channel so as to selectively motivate the ball through each of the positions and being freely rotatable within said cage; wherein the improvement comprises:

(a) a removable insert for selectively positioning within said valve and surrounding the outlet portion of said flow channel when placed in said valve body and having retention means associated therewith for retaining said insert within said valve body when said valve is operational; said seat ring being removable through said channel when said insert is removed from said channel and said seat being held in a fixed position by said insert when said valve is operational; said valve body further including a wall surface spaced from and generally surrounding said outlet portion of said flow channel and defining a cavity having a diameter at least sufficiently large to permit passage of



said seat ring and said ball therethrough when said insert is removed therefrom; and

(b) said ball cage including an aperture therein sufficiently large to allow passage of said ball therethrough; said cage being movable when said valve is non-operational to a position such that said aperture is aligned with said cavity to allow removal of said ball from said cage and valve body through said cavity when said insert and seat ring are removed from said cavity.

4,446,884

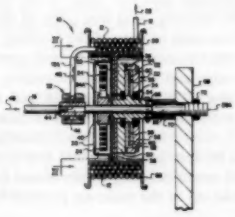
TAKE-UP REEL WITH CONTROLLED REWIND VELOCITY

Homer J. Rader, Jr., 10035 Surrey Oaks, Dallas, Tex. 75229

Continuation of Ser. No. 271,555, Jun. 8, 1981, abandoned. This application Oct. 12, 1983, Ser. No. 541,296

Int. Cl.³ B65H *75/48*

U.S. Cl. 137—355.23 **6 Claims**



1. An air hose reel assembly comprising, in combination:

a support shaft having a passage for conducting air from a high pressure supply;

a take-up reel assembly concentrically aligned with said support shaft, said take-up reel assembly having a cylindrical rim on which air hose can be wound and having a radially projecting hub connected to said rim in such a way that said rim includes rim portions which extend axially with respect to the axis of rotation of said rim in opposite directions from said hub to form enclosed areas on each side of said hub;

a damper assembly interposed between said support shaft and one of said rim portions and disposed entirely within one of said areas formed by said one rim portion on one side of said hub, said damper assembly having a housing secured to said hub and defining an annular damper cham-

ber in concentric, spaced relation with said support shaft, a stator member secured to said shaft and received within said damper chamber, and a volume of a viscous fluid contained within said damper chamber and surrounding said stator member;

a wind-up spring motor disposed between said support shaft and the other of said rim portions and entirely within the other of said areas formed by said other rim portion on the opposite side of said hub, said spring motor being coupled between said shaft and said hub on said opposite side of said hub;

rotary fluid sealing means for said damper chamber and supporting said take-up reel assembly for rotation on said shaft;

an air hose having an inlet end and a delivery end, said air hose being wound around said take-up reel; and,

rotary fluid sealing means connecting said support shaft passage in fluid communication with the inlet end of said air hose.

4,446,885

WALL MOUNTED MIXING VALVE

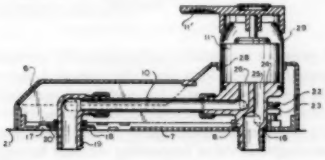
Werner Nolden, Wittlich, Fed. Rep. of Germany, assignor to American Standard, Inc., New York, N.Y.

Filed Mar. 30, 1982, Ser. No. 363,754

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1981, 3112616

Int. Cl.³ F16L *5/00*; E03C *1/04*

U.S. Cl. 137—360 **5 Claims**



1. A wall mounted mixing valve with a cold and hot water inlet and a mixing water discharge spout consisting of individual structural elements and at least one cartridge mixing valve which are covered by a housing, whereby the inlets are designed in the form of connecting pieces for a direct connection with the pipe ends of the hot and cold water lines, said connecting pieces being adjustably mounted in spaced apart position in a support plate of said mixing valve and coupled to each other by means of a separate pipe bridge, said wall mixing valve comprising: a housing for covering said structural elements is pivotably mounted on said support plate and is parallel with the wall; said support plate, including two aperatures for mounting said connecting pieces, one of said aperatures having a diameter corresponding to the dismeter of said one connecting piece and said connecting piece providing a pivot bearing for mounting said support plate, and said other aperature being spaced from said one connecting piece and having a press plate adjustably mounted therein, said press plate having a slotted opening for receiving said other connecting piece and a nut coupled to said other connecting piece for mounting said support plate against the wall and said one connecting piece having a laterally extending shoulder with a threaded opening therein for receiving a set screw for connecting said support plate.

4,446,886

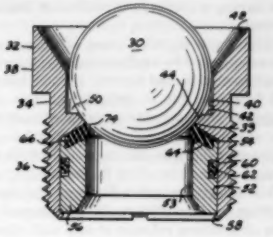
SAFETY RELIEF VALVE SOFT SEAT

Wesley L. Taylor, and Julian S. Taylor, both of 8300 SW. 8, Oklahoma City, Okla. 73108

Filed Mar. 8, 1982, Ser. No. 355,981

Int. Cl.³ F16K *15/00*

U.S. Cl. 137—516.29 **8 Claims**



1. In a relief valve of the poppet-type including a housing having an inlet passageway communicating with an outlet port and having a spring assembly biasing a valve toward the inlet passageway, the improvement comprising:

a seat support in the inlet passageway having a valve seat facing and seating the spring biased valve for closing the inlet passageway;

a resilient seal ring disposed on the upstream side of said valve seat and projecting downstream in a manner to concentrically contact said spring biased valve prior to its contact with said valve seat; and,

means including a sleeve bonded to and maintaining said resilient seal ring concentric with said valve seat.

4,446,887

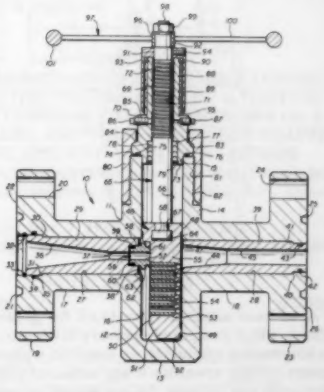
VARIABLE HIGH PRESSURE CHOKE

Billy L. Redmon, and Buford G. Forester, both of Pasadena, Tex., assignors to Custom Oilfield Products, Inc., Houston, Tex.

Filed Dec. 21, 1981, Ser. No. 332,939

Int. Cl.³ F16K *37/00*, *3/16*

U.S. Cl. 137—556 **28 Claims**



1. A variable high pressure choke comprising

a hollow valve body having an open end, a closed end and a cylindrical cavity therein,

cover means for said open end,

aligned tubular inlet and outlet portions on opposite sides of

said valve body defining an upstream side, a downstream side and a straight bore intersecting said cavity at a right angle thereto,

a tubular seal member in said bore having an end portion positioned in said cavity,

said tubular inlet portion including a tubular insert of wear resistant metal having a longitudinally tapered cross section operable to reduce the rate of fluid flow therethrough and having a recess in the reduced diameter end portion thereof,

said tubular seal member being of a wear resistant material and surrounded by resilient sealing material and supported in said recess in said tapered tubular insert and having an end face operable to provide the sole seal between the upstream and downstream sides of said valve body,

a flow selector member in said cavity having a solid, flow-obstructing portion and a portion with flow controlling passage means extending therethrough,

said flow selector member having a sliding fit in said cavity between an extended position with said solid portion in flow obstructing relation to said seal member end portion and movable to successively retracted positions moving said flow controlling passage means relative to said seal member to provide fluid flow passages of different areas,

said flow selector member having unsealed metal-to-metal sliding contact with the wall of said cavity on the downstream side thereof and sealed on the upstream side solely by engagement with the end face of said seal member, and

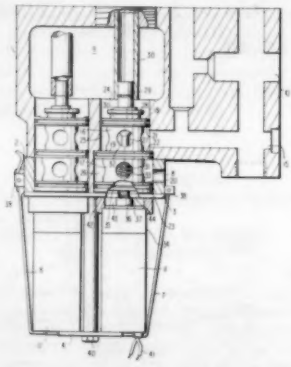
operating means on said cover means for moving said flow selector member between said extended and retracted positions and including sealing means preventing pressure leakage during operation thereof.

4,446,888

SOLENOID ACTUATED VALVE BLOCK FOR GLASSWARE FORMING MACHINES

Jorge A. Heredia de la Paz, and David F. Sanchez, both of Monterrey, Mexico, assignors to Vitro-Tec Fideicomiso, Monterrey, Mexico

Filed Dec. 15, 1981, Ser. No. 330,920
Int. Cl.³ F15B *13/08*
U.S. Cl. 137—596.17 **3 Claims**



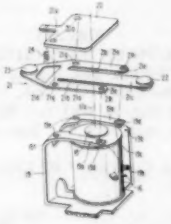
1. A solenoid actuated valve block for glassware forming machines, which comprises a primary block provided with an inner longitudinal operational air manifold, a plurality of valve chambers opening towards a lower surface of said block at one of their ends and towards the operational air manifold at the other end thereof, a plurality of cartridge valves arranged within said valve chambers, each chamber having a duct for operational air individually connected with a pneumatic operational line of the machine and an exhaust duct opening to the atmosphere, a plate attached to said lower surface of the block, said plate having a plurality of openings coincident with each of said valve chambers of the block, a plurality of solenoids mounted on said plate and directly coupled with the cartridge valves, the coupling between said solenoids and said cartridge valves comprising a lost motion mechanical memory which, on reception of one pulse by the solenoid, pushes the cartridge valve and forces it to remain open for the admission of operational air, until reception of the next pulse by said solenoid, when it releases the cartridge valve to be closed and permits the operational air to be exhausted, and a compensating spring, one end of which bears against said cartridge valve and the other end of which bears against said lost motion mechanical memory, said compensating spring being stronger than the force necessary to open said valve but weaker than the maximum force exerted by said solenoid, in order to permit compensation of the lost motion of said mechanical memory for opening and closing the valve.

4,446,889

PRESSURE MODULATING VALVE ASSEMBLY

Naoji Sakakibara; Hiroyuki Amano, both of Chiryu, and Hiroaki Morioka, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 3, 1982, Ser. No. 404,738
Claims priority, application Japan, Aug. 7, 1981, 56-123130
Int. Cl.³ F15B *13/044*; F16K *11/00, 11/02*
U.S. Cl. 137—625.4 **5 Claims**



1. A pressure modulating valve assembly comprising housing means having at least one inlet port and one outlet port, solenoid coil means mounted in said housing means, magnetic yoke means associated with said coil means and having curved arm means extending over one end of said coil means, a resilient non-magnetic valve supporting member having leg means secured to said yoke means in overlying relation to said curved arm means and said solenoid coil means, armature means secured to said valve supporting means at a location spaced from the securement of said valve supporting member to said yoke means with said armature overlying said solenoid coil means, spring means connected to said armature means for normally biasing said armature means and valve supporting member about said curved surface of said yoke means away from said solenoid coil means and at least one valve member on said valve supporting member adapted to be moved into and out of engagement with valve seat means surrounding said inlet port.

4,446,890

CONTINUITY ACTUATED ISOLATION VALVE ASSEMBLY

William E. Simpson, Jr., Chamblee, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Oct. 5, 1981, Ser. No. 308,359
Int. Cl.³ F16K *17/10*
U.S. Cl. 137—87 **5 Claims**

1. A valve assembly to control the flow of fluid to a utility function comprising:

a first fluid pressure port and a first fluid return port on one side of said valve assembly, each connected to a fluid source;

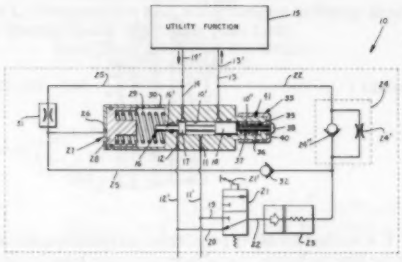
a second fluid pressure port and a second fluid return port on

another side of said valve assembly, each connected to said utility function;

a reciprocable valve stem mounted between said first and said second ports;

biasing means operative on said stem normally retaining it in a position blocking communication between all of said ports;

a valve arrangement connected between said first and second fluid pressure ports and operative when actuated to open momentarily and then close to thereby release a predetermined amount of fluid therethrough and into said utility function;



a fluid return passage connected between said first and second fluid return ports;

a normally inoperative, fluid-actuated piston connected to said valve stem to move it when operative in opposition to said biasing means out of its normal position aforesaid to establish communication between said first and second fluid pressure ports and between said first and second fluid return ports; and

a spur fluid passage between said fluid return passage and said piston for the actuation of said piston by pressure in said fluid return passage.

4,446,891

METHOD FOR REPAIRING AND/OR REINFORCING A PIPE SYSTEM, AND A DEVICE FOR UTILIZATION OF THE METHOD

Sven R. V. Gebelius, Drottningholmsvägen 195, Bromma, Sweden (S-161 36)

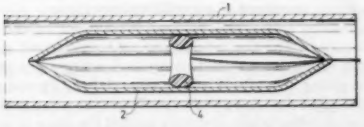
PCT No. PCT/SE81/00325, 371 Date Jun. 17, 1982, 102(e) Date Jun. 17, 1982, PCT Pub. No. WO82/01489, PCT Pub. Date May 13, 1982

PCT Filed Nov. 4, 1981, Ser. No. 395,045

Claims priority, application Sweden, Nov. 4, 1980, 8007743

Int. Cl.³ F16L *55/16*

U.S. Cl. 138—97 **6 Claims**



1. In a device for repairing and/or reinforcing a pipe wherein a tubular member enclosing an explosive charge is insertable into the pipe and arranged to expand the tubular member by means of explosive force into a contacting position against the surrounding pipe, the improvement comprising a plurality of longitudinally extending deformations in the tubular member adapted to give the tubular member a cross-sectional area of an enclosing circle having a diameter smaller than the internal diameter of said pipe so that said tubular member and deformations are expanded substantially radially by means of explosive force when the explosive charge is detonated into a substantially completely contacting position against the surrounding internal wall surface of the pipe, and at least the end portion of the tubular member intended to be first inserted into the pipe has a substantially pointed shape to serve as a guiding means for the tubular member during insertion and is adapted to open and expand by the explosive force into contact with the inner wall of the pipe after the portion of said tubular member other than said end portions has expanded into said contacting position.

4,446,892

METHOD AND APPARATUS FOR MONITORING LENGTHS OF HOSE

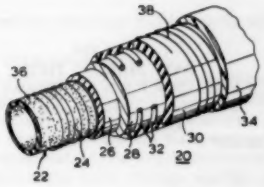
Anthony J. Maxwell, Monte Carlo, Monaco, assignor to Maxwell AG, Oberwil, Switzerland

Filed Sep. 3, 1980, Ser. No. 183,716

Claims priority, application United Kingdom, Sep. 5, 1979, 7930712

Int. Cl.³ G01M *3/28*

U.S. Cl. 138—104 **7 Claims**



1. A hose for transporting fluid having electromagnetic properties, said hose having at least two plies between which fluid normally is not present; a sensing element between the plies and forming part of a detection circuit operable to signal the presence of fluid between the plies as a result of failure of one of the plies; and a particulate material located between the plies, the sensing element being responsive to at least one of the fluid's electromagnetic properties to initiate operation of the said circuit, and the particulate material enhancing the said at least one electromagnetic property of the fluid to which the sensing element is responsive.

4,446,893

METHOD FOR TRANSPORTING A WEFT THREAD THROUGH THE WEAVING SHED OF A WEAVING MACHINE THROUGH THE INTERMEDIARY OF A FLOWING FLUID, AND WEAVING MACHINE ADAPTED FOR THE APPLICATION OF THIS METHOD

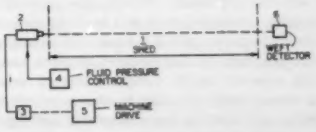
Paul Gunneman, Mierlo, and Gerardus W. Jeuken, Deurne, both of Netherlands, assignors to Ruti-Te Strake B.V., Deurne, Netherlands

Filed Nov. 7, 1980, Ser. No. 205,013

Claims priority, application Netherlands, Nov. 15, 1979, 7908357

Int. Cl.³ D03D *41/00*

U.S. Cl. 139—11 **6 Claims**



6. In a weaving machine, the combination comprising

a weft inserting means for moving weft thread through a shed at a given speed;

first means for generating a first signal in response to the measured time occupied during the movement of said weft thread through the shed;

second means for generating a second signal corresponding to the operating speed of the weaving machine;

a comparator connected to said first means and said second means to receive and compare said first signal and said second signal and to generate a third signal which is a measure of the discrepancy between said first and second signals; and

means connected to said comparator to receive said third signal to adjust the speed of insertion of the weft thread relative to the speed of the weaving machine in response to said third signal.

4,446,894

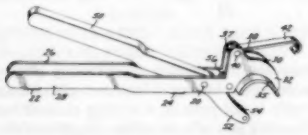
GATE MAKING TOOL

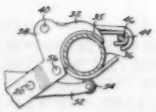
Donald R. Larson, 12530 Dolan Ave., Downey, Calif. 90242

Filed May 7, 1982, Ser. No. 375,886

Int. Cl.³ B21F *33/00*

U.S. Cl. 140—57 **9 Claims**





1. A clamping device specially adapted to secure fence clips to wire fences and adjacent posts including:

(a) a hooking element provided with hooking jaw means adapted to hold a fence post;

(b) a stretch hook element hingedly mounted on said hooking element and positioned to hold a conformingly shaped fence clip which is, in turn, engaged with a fence wire and a fence post held by said jaw hooking means;

(c) a separate clip bender element having a clip bender arm pivotally connected with said hooking element, said arm adapted to press against a fence clip to engage it with a fence post held by said hooking element; and

(d) two separate handle means connected to said hooking jaw means and said clip bender arm, respectively for closing said hooking jaw means and said clip bender arm together to form a gripping area which can bend a clip held therein tightly around an engaged fence wire and post.

4,446,895

METHOD FOR FILLING PRESSURIZED GAS INTO A CYLINDER DEVICE

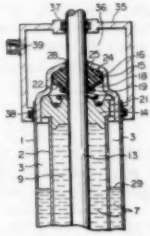
Tetsuo Kato, Kanagawa, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Division of Ser. No. 140,861, Apr. 16, 1980, abandoned. This application Mar. 10, 1982, Ser. No. 356,644

Claims priority, application Japan, Apr. 20, 1979, 54-48815

Int. Cl.³ B65B *3/04*; F16F *9/43*

U.S. Cl. 141—4 **4 Claims**



1. A method for filling pressurized gas into a cylinder device of the type including coaxial inner and outer tubes having first ends and second ends, a cap closing said first ends of said inner and outer tubes, a piston slidably disposed in said inner tube, a piston rod secured to said piston and extending therefrom axially outwardly of said inner tube through said second end thereof, a rod guide secured to second ends of said inner and outer tubes, said piston slidably extending through and being guided by said rod guide, a cap member secured to said second end of said outer tube, said cap member having a central opening through which said piston rod extends, with a clearance between said piston rod and said cap member, a seal member located inwardly of said cap member, said piston rod slidably and sealingly extending through said seal member, and a coil spring positioned between said rod guide and said seal member and urging said seal member axially outwardly toward said cap member, said method comprising:

providing said seal member with a radially outer surface spaced radially inward from said cap member;

providing said seal member, on an axially outer surface thereof, with a sealing surface complementary in configuration to an adjacent surface portion of the inner surface of said cap member, such that said coil springs urges said sealing surface into sealing contact with said inner surface portion;

providing a cavity between said inner surface of said cap member and said axially outer surface of said seal member, at a position radially inwardly of said sealing surface and connected to the exterior through said clearance;

sealingly surrounding the exterior of said cap member with a filling container of a gas filling apparatus;

introducing pressurized gas into the interior of said filling container, thereby introducing said pressurized gas into said clearance and said cavity and acting on a pressure receiving area of said seal member defined by said cavity, said gas being at a pressure sufficient to move said entire seal member axially inwardly against the force of said coil spring such that said sealing surface is spaced from said inner surface portion of said cap member to form a gas filling passage therebetween, said pressure receiving area of said seal member and the dimension of said seal member being determined to permit said movement of said entire seal member, and thereby filling said pressurized gas into the interior of said cylinder device;

stopping the supply of said pressurized gas into said interior of said filling container when said pressurized gas is filled into said interior of said cylinder device to a predetermined pressure;

reducing the pressure in said filling container to a level such that the spring force of said spring and the pressure in the cylinder device act to move said entire seal member axially outwardly until said sealing surface contacts said inner surface portion, thereby closing the gas filling passage; and

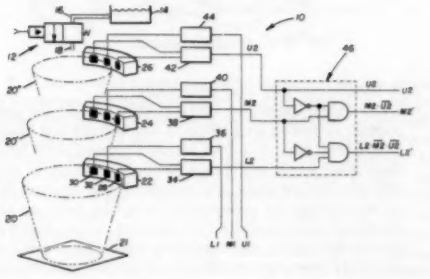
thereafter removing said filling container from said cylinder device.

4,446,896

CUP FILLING APPARATUS

Gerald L. Campagna, San Jose, Calif., assignor to George Bumb and Timothy Bumb, both of San Jose, Calif.

Filed Jun. 7, 1982, Ser. No. 386,212
Int. Cl.³ B67D *3/00*
U.S. Cl. 141—198 **7 Claims**



1. An automatic control for an apparatus of the type which dispenses fluid into a container and which has a dispensing valve having an outlet for dispensing said fluid when said dispensing valve is activated, said automatic control comprising:

a plurality of first sensor means, each of said first sensor means for developing a first energy field, said first energy field being perturbed by the presence of a container disposed therein; and, in response to a first energy field perturbation caused by the presence of a container, each of said first sensor means further for developing a first signal, each of said first sensor means deployed at differing distances below said outlet of said dispensing valve;

a plurality of second sensor means, each of said second sensor means being associated with a different one of said first sensor means; said second sensor means for developing a second energy field distinct from said first energy field, said second energy field being perturbed by the presence of fluid in said second energy field; and, in response to said second field perturbation caused by the presence of said fluid, each of said second sensor means further for developing a second signal; and

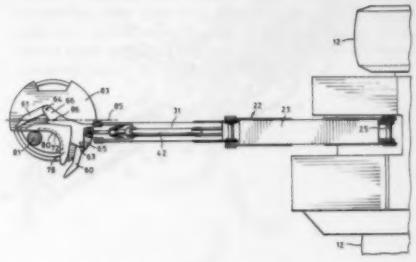
logic means responsive to said first signal of each of said first sensor means for determining an occurrence of said first field perturbation at at least one of said first sensor means and operative for developing a switching signal in the event said occurrence is determined for application to said dispensing valve to activate said dispensing valve, said logic means further responsive to said second signal of one of said second sensor means associated with the one of said first sensor means being at the highest elevation of all of said first sensor means in which said occurrence of said first field perturbation is determined for determining an occurrence of said second field perturbation and operative to cancel said switching signal when said occurrence of said second field perturbation is determined.

4,446,897

IMPROVEMENTS IN DISC FELLING HEADS

John Kurelek, Brantford, Canada, assignor to Koehring Canada Limited, Brantford, Canada

Filed Jan. 27, 1982, Ser. No. 343,300
Claims priority, application Canada, Aug. 5, 1981, 383217
Int. Cl.³ A01G *23/08*
U.S. Cl. 144—34 R **8 Claims**



1. A felling head for attachment to a boom, the felling head comprising:

an upper part and a lower part,

the upper part including a brace portion adapted to contact a tree being felled, along with tree grappling means adapted to clasp a tree trunk against said brace portion,

the lower part having a circular saw blade mounted thereon in a plane perpendicular to the longitudinal extent of a tree clasped between the brace portion and the grappling means,

and housing means for said circular saw blade, the housing means being shaped to expose the circular saw blade over an arc thereof which is offset with respect to a line which passes through the saw blade axis and is parallel to said boom, whereby the felling head can cut trees in a scything action with the boom swinging sideways,

the felling head including means for mounting the felling head to the boom for pivotal motion in a vertical plane substantially parallel with the boom, the said offset exposed arc of the circular saw blade lying substantially wholly to one side of a hypothetical plane which passes through the rotational axis of the saw blade and is parallel to the boom.

4,446,898

SELF-ELEVATING WOOD SPLITTER AND MOUNTING ARRANGEMENT

Dale A. Manteufel, Hortonville, Wis., assignor to Ingersoll Equipment Co., Inc., Winneconne, Wis.

Continuation-in-part of Ser. No. 385,787, Jun. 7, 1982, abandoned. This application Apr. 20, 1983, Ser. No. 486,933
Int. Cl.³ B27L *7/00*
U.S. Cl. 144—193 A **24 Claims**

2. A wood splitter adapted to be mounted on a tractor, or the like, comprising:

mounting means for effecting a fixed connection of said wood splitter to said tractor;

an elongated wood supporting frame extending rearwardly of said mounting means;

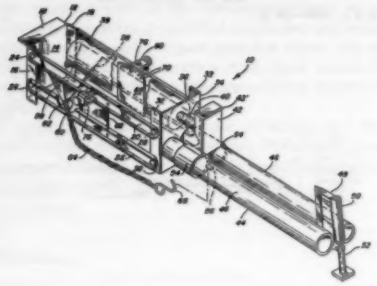
link means pivotally interconnecting said wood supporting frame and said mounting means to provide four-bar linkage means for vertical movement of said frame with respect to said mounting means;

hydraulic splitting means operatively associated with said wood supporting frame and movable with respect thereto;

elevator means associated with said four-bar linkage means and adapted for operative connection with said hydraulic splitting means whereby operation of said splitting means

effects raising and lowering of said wood supporting frame; and

locking means for selectively locking said frame at a desired elevation, including locking plate means associated with said four-bar linkage means, said locking plate means defining arcuately spaced opening means adapted for



selective cooperative engagement with latch means on said link means,

said mounting means having means thereon permitting said splitter to be mounted at generally the same height from the ground on different tractors having associated attachment points a differing heights from the ground.

4,446,899

DOUBLE-SIDED TENONER

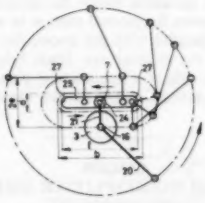
Jacobus H. Luyten, Va Steyl, Netherlands, assignor to Helmes Machinefabriek B.V., Netherlands

Filed May 11, 1982, Ser. No. 376,966

Claims priority, application Netherlands, May 18, 1981, 8102437

Int. Cl.³ B27F *1/10*

U.S. Cl. 144—201 **20 Claims**



2. An apparatus for milling tenons in a workpiece, comprising:

(A) a frame;

(B) a workpiece carrier for carrying a workpiece along a path through the frame;

(C) a first cutter assembly mounted to the frame and disposed at a first side of the path for milling a first tenon in the workpiece; and

(D) a second cutter assembly mounted to the frame and disposed at a second side of the path opposite the first side for milling a second tenon in the workpiece; each of the first and second cutter assemblies comprising:

(1) a support assembly mounted on the frame, comprising a carriage tiltable in first and second directions around respective first and second axes and displaceable relative to the frame in two mutually perpendicular directions; and

(2) a cutter mechanism for milling the tenon in the workpiece, the cutter mechanism being mounted on the carriage and being displaceable and tiltable therewith for setting the location and position of the tenon to be milled.

4,446,900

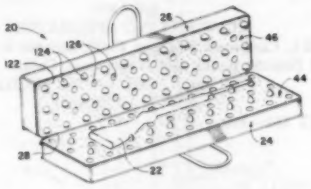
FIREARM CARRYING CASE

Mark J. Markovich, Iowa Falls, Iowa, assignor to Welsh Sporting Goods Corp., Iowa Falls, Iowa

Filed May 17, 1982, Ser. No. 378,915

Int. Cl.³ B65D *81/04*

U.S. Cl. 150—52 R **4 Claims**



1. A firearm carrying case, comprising:

two fabric shell assemblies, each including a fabric side panel member extending longitudinally and laterally and having a peripheral edge with four rounded corners and a fabric three-sided zipper half-gusset having a longitudinal edge and two terminal edges, said peripheral edge having a first portion defined by commencing at a first point on said peripheral edge where a first rounded corner begins or shortly therebefore and continuing around all of said four rounded corners to a second point where a fourth rounded corner terminates or shortly thereafter and a second portion defined by commencing at said first point on said peripheral edge extending longitudinally therealong and terminating at said second point on said peripheral edge, said three-sided zipper half-gusset being sewn transversely to said first portion of said peripheral edge of said side panel member along said longitudinal edge;

a hinging panel defined by two longitudinal edges and two lateral edges and including a backing material panel enveloped by a fabric material, folded at a longitudinal centerline, sewn within one-half inch (½") from said centerline to define a seam, each of said longitudinal edges sewn to each of said second portions of said peripheral edges of said panel members and each of said lateral edges sewn to each of said terminal edges of said three-sided zipper half-gusset and, upon folding said two fabric shell assemblies apart in an open configuration, defining a cavity within each of said fabric shell assemblies, said cavity having an inner portion and an outer portion;

two rigid support assemblies, each including a rigid wall member extending longitudinally and laterally and two rigid flange members extending longitudinally along and transversely from said rigid wall member to define a U-shaped channel, each of said two rigid support assemblies being received by each of said inner portions of said cavities in a substantially parallel relationship with each of said side panel members; and

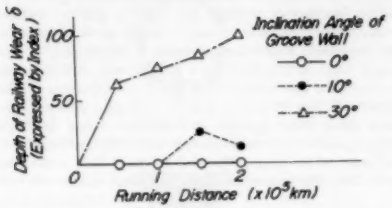
two foam beddings, each occupying each of said outer portions of said cavities and being received by each of said U-shaped channels and each substantially contacting each of said rigid wall members at a substantially flat first surface and each having a convoluted second surface defined by fingers and recesses, said fingers extending outwardly from said cavity and said recesses extending inwardly into said cavity, whereby upon folding said two fabric shell assemblies to a closed configuration, said convoluted surfaces of said foam beddings having a proclivity to align for interlocking said fingers with said recesses in a mating relationship.

4,446,901

HEAVY DUTY PNEUMATIC RADIAL TIRES

Kazuyuki Endo, Higashimurayama, and Shigeo Makino, Tokorozawa, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed May 4, 1982, Ser. No. 374,664
Claims priority, application Japan, May 13, 1981, 56-71945; Jul. 31, 1981, 56-119286
Int. Cl.³ B60C 11/06
U.S. Cl. 152—209 R 14 Claims



1. A heavy duty pneumatic radial tire comprising; a carcass of a substantially radial construction composed of at least one rubberized ply layer containing cords embedded therein and a belt superimposed about said carcass for stiff reinforcement beneath a tread and composed of at least two rubberized ply layers each containing metal cords embedded therein, said metal cords of which being crossed with each other at a relatively small angle with respect to the circumferential direction of tire, and said tread being provided with a plurality of continuous or discontinuous zigzag circumferential ribs defined along the widthwise direction of tire by at least three, substantially zigzag main grooves extending circumferentially of said tread, said main grooves comprising one or a pair of central circumferential grooves located at a substantially central region of said tread and a pair of outside circumferential grooves defining each of outermost ribs of said tread, said central circumferential groove has such as symmetrical cross-sectional shape with respect to a center line of said groove that an inclination angle of a groove wall of said groove with respect to a normal line drawn from an outer surface of said tread and passing an edge of said groove in the cross section perpendicular to said groove wall is 14°–24° in a region extending from the groove bottom to at least 50% of groove depth, said outside circumferential groove has such an unsymmetrical cross-sectional shape with respect to a center line of said groove that an inclination angle of an outer groove wall of said groove in the rotation axial direction of tire is 14°–24° and an inclination angle of an inner groove wall of said groove in a region extending from the outer surface of said tread to at least 10% of groove depth is made smaller than that of said outer groove wall.

4,446,902

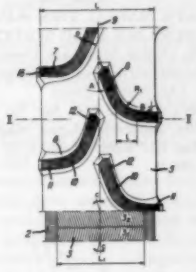
TIRES FOR DRIVE WHEELS OF AGRICULTURAL TRACTORS OR SIMILAR VEHICLES

Francois Madec, Versailles; Emile Delobelle, Colombes, and Georges Donvez, Neuilly sur Seine, all of France, assignors to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Aug. 26, 1982, Ser. No. 411,690
Claims priority, application France, Aug. 31, 1981, 81 16676
Int. Cl.³ B60C 11/08, 13/00, 9/20
U.S. Cl. 152—209 B 17 Claims

1. A tire for drive wheels of agricultural tractors or similar vehicles having a tread with raised members which consist of large lugs spaced from one another and arranged in two rows each of which extends axially over approximately a different half of the tread, the lugs being alternately staggered in the circumferential direction of the tire and each consisting of two essentially rectilinear segments joined to one another and forming different angles with the circumferential direction of the tire, characterized by the fact that

the tire comprises a radial carcass reinforcement whose meridian curvature, with the tire mounted on its rim and inflated normally but not flattened by a load, is at its maximum in the region of the shoulders of the tire and a tread reinforcement having an axial width at most equal to 0.9 times the axial width of the tire arranged radially outward around the radial carcass reinforcement and consisting of at least two plies having parallel cables in each ply which cross from one ply to the next forming about equal angles at the equator of less than 30° with the circumferential direction of the tire, and



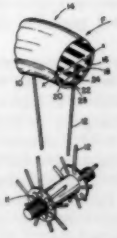
the axially outward segment of the lugs projects axially from the corresponding edge of the tread reinforcement and forms an angle of from 85° to 100° with the circumferential direction of the tire and the axially inward segment of the lugs forms an angle less than 30° with the circumferential direction of the tire about equal to the angles of the radially outward plies of the tread reinforcement, the axially inward segment, which is intended to touch the ground in the contact area of the tire before the axially outward segment, being connected to the axially outward segment by means of an intermediate segment, extending axially over a width equal to approximately 0.15 times the axial width of the tire.

4,446,903

NON-PNEUMATIC TIRE

Richard L. Clinefelter, Littleton, Colo., and Larry R. Bradford, Woodridge, Ill., assignors to The Gates Rubber Company, Denver, Colo.

Filed Jul. 31, 1978, Ser. No. 929,399
Int. Cl.³ B60C 7/00
U.S. Cl. 152—323 23 Claims



1. A non-pneumatic tire for a wheelchair or other wheeled apparatus, comprising: an integrally molded endless non-jointed elastomeric solid core element; and at least one turn of a strain-resisting tensile member embedded in the interior of the solid core element and spaced substantially from both the

radial innermost extent of and sidewalls of the tire, and extending continuously throughout such interior, and the tensile member being sufficiently extensible to permit snap-on mounting of the tire onto a channel-shaped rim.

4,446,904

PNEUMATIC RADIAL TIRE HAVING HIGHLY DURABLE BEAD STRUCTURE

Katsuji Kishida, Osaka; Masakazu Oonishi, and Keijiro Oda, both of Kawanishi, all of Japan, assignors to The Toyo Rubber Industry Co. Ltd., Osaka, Japan.

Filed Apr. 21, 1982, Ser. No. 370,544
Claims priority, application Japan, May 1, 1981, 56-67543
Int. Cl.³ B60C *15/06, 9/00, 15/00*
U.S. Cl. 152—356 R **1 Claim**

1. In a pneumatic radial tire having an annular side wall, an annular bead portion having a lower base including an annular bead core, beneath the side wall, and an annular crown portion above the side wall, the improvement comprising:

a carcass ply layer of organic textile cords extending from the bead portion across the crown portions at an angle of 90° relative to the equatorial line of the tire, the lower end of said carcass ply layer being turned up around the annular bead core from the inside to the outside of the tire and terminating within the bead portion to form a turned-up portion of said carcass ply layer;

a reinforcing strip of steel cords positioned outwardly of and adjacent to said turned-up portion of said carcass ply layer, having a top end extending radially outwardly, above said turned-up portion;

an organic textile cord fabric disposed outwardly adjacent said reinforcing strip and extending from a radially inner side of said carcass ply layer at the lower base of the bead portion to a lower region of the side wall above said reinforcing strip;

a bead filler of approximately triangular sectional shape having an upper end extending to the side wall;

said bead filler consisting of high hardness rubber stock of approximately triangular sectional shape and medium hardness rubber stock positioned outwardly of and adjacent to said high hardness rubber stock and being enclosed by said carcass ply layer including said turned-up portion thereof, and said reinforcing strip;

a cap of organic textile cord fabric covering the upper end of said reinforcing strip; and

a rubber buffer fin-shaped in section, having a hardness lower than said medium hardness stock by 3° to 20° Shore A hardness, disposed radially outwardly of said upper end of said reinforcing strip and axially outwardly of and adjacent to said medium hardness rubber stock.

4,446,905

RADIAL TIRES FOR RUNNING ON ROUGH GROUND

Akira Tamura, and Yasuo Suzuki, both of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Oct. 28, 1981, Ser. No. 315,797
Claims priority, application Japan, Nov. 6, 1980, 55-155215
Int. Cl.³ B60C *9/20*
U.S. Cl. 152—361 DM **4 Claims**

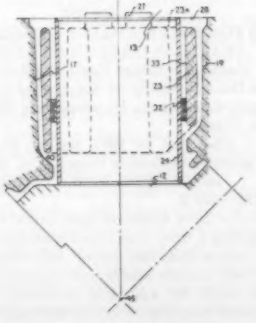
1. In pneumatic radial tires for running on rough ground in which a carcass composed of at least one cord layer arranged in radial plane of the tire is surrounded with a tread reinforcing layer composed of a plurality of belts embedded in a crown portion of the tire, the improvement wherein, said tread reinforcing layer, comprises a pair of main intersecting belts having different belt widths in which cords are arranged to intersect with each other across an equator of the tire, and supplemental belts arranged inside and outside of said pair of main intersecting belts in the radial direction of the tire respectively in which cords have an elongation at breakage at least 40% larger than that of the cords of the main intersecting belts, and an angle of the cords in the belt having the smaller width in the main intersecting belts with respect to the above described equator is 2°-9° smaller than the angle of the cords in the belt having the larger width and an angle of the cords of the supplemental belt positioned between the main intersecting belts and the carcass ply is 35°-60°.

4,446,906

METHOD OF MAKING A CAST ALUMINUM BASED ENGINE BLOCK

Allen D. Ackerman, Troy, and Howard A. Aula, Dearborn Hgts., both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 13, 1980, Ser. No. 206,430
Int. Cl.³ B22D *19/00*
U.S. Cl. 164—112 **6 Claims**



1. A method of making a cast aluminum based engine block

having one or more combustion chambers, the method comprising:

(a) stationing a core assembly in a die casting assembly which is effective to provide a cavity when the assembly is closed to define a closed-deck block, said die casting assembly having means to reserve port openings and combustion chambers through the deck of the closed-deck block, said core assembly having a water soluble alkaline metal salt member selected from the group of KCl and NaCl, formed by die casting under pressure and heated to a shaped body effective to define in cooperation with said die casting assembly a submerged cast chamber, said salt member having at least one hollow cylindrical portion arranged to wrap about in spaced relation thereto one or more of said means to reserve combustion chambers, said core assembly also having a cylindrical iron liner spaced radially inwardly from said salt member and adapted to fit snugly about a portion of said means of said die casting assembly, and a resilient low melting metal mesh collar interposed between said core and liner to stabilize, support and center said liner on said core, said collar dissolved after the molten metal has been introduced into said cavity and is in place;

(b) introducing molten aluminum based metal under pressure into said cavity to fill same and to form said block having said chamber; and

(c) removing said salt member from said cast block by water dissolution, water being admitted to said chamber through said port openings and the dissolved salt member being withdrawn through said port openings.

4,446,907

DIE-CASTING METHOD

Haruo Suzuki, Aichi, and Shigeyoshi Hashimoto, Anjo, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

PCT No. PCT/JP79/00034, 371 Date Oct. 14, 1980, 102(e) Date May 22, 1979, PCT Pub. No. WO80/01657, PCT Pub. Date Aug. 21, 1980

PCT Filed Feb. 14, 1979, Ser. No. 266,014

The portion of the term of this patent subsequent to Apr. 19, 2000, has been disclaimed.

Int. Cl.³ B22D *18/02*

U.S. Cl. 164—120 **8 Claims**

1. A die-casting method comprising:

a first step of relatively moving dies into close contact so as to form therebetween a die cavity for casting a product, a runner through which molten metal is injected into said die cavity, and a substantially non-narrowing squeeze passage connected directly to said die cavity at a point other than the point of connection between said die cavity and said runner;

a second step of injecting, by forwardly moving an injection plunger to effect a predetermined injection pressure, the molten metal from said runner via a gate into said die cavity and said squeeze passage to fill said die cavity and said squeeze passage with the molten metal;

a third step of starting a squeezing displacement of the molten metal in said non-narrowing squeeze passage by moving a squeeze plunger through said squeeze passage from a position therein remote from said die cavity toward said die cavity and at a predetermined squeezing pressure greater than said injection pressure and at a time before said gate is blocked by solidified molten metal;

continuing the squeezing on said molten metal by said squeeze plunger in said passage at said predetermined squeezing pressure until said cavity is filled voidlessly and, during said continued squeezing, forcing molten metal out of said die cavity through said gate into said runner by the molten metal displaced out of said squeeze passage by said squeeze plunger and until the molten metal is completely solidified at least in said die cavity while retaining said squeeze plunger substantially fully inside said passage to produce a solidified voidless die-cast product;

preventing said injection plunger from being moved backward during said third step and continued squeezing by the effect of said greater pressure applied by said squeeze plunger;

a fourth step of retracting said squeeze plunger to remove said squeezing pressure from said squeeze passage after the molten metal is solidified in said die cavity;

a fifth step of relatively moving said dies away from one another including removing therefrom the die-cast body which has been solidified in said die cavity, runner and squeeze passage; and

a sixth step of removing from said die-cast body the portions thereof which have been solidified in said runner and squeeze passage and also removing, from the portion of the die-cast body solidified in the die cavity, the part of the die-cast body generally opposing said squeeze passage, the removal of said die-cast body part being effected in the squeezing direction of the squeeze plunger, said part having a cross-sectional area greater than the cross-sectional area of the squeeze passage.

4,446,908

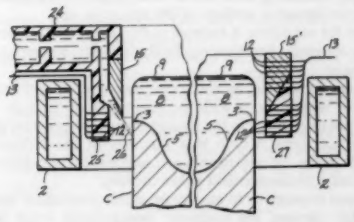
INFRARED IMAGING FOR ELECTROMAGNETIC CASTING

Gary L. Ungarean, Woodbridge, and John C. Yarwood, Madison, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 111,244, Jan. 11, 1980. This application Sep. 25, 1981, Ser. No. 305,440

Int. Cl.³ B22D *27/02, 11/16*

U.S. Cl. 164—452 **17 Claims**



1. A process of determining the position of the liquid/solid interface at the periphery of a material load in an electromagnetic casting apparatus during an electromagnetic casting run, said electromagnetic casting apparatus including a primary casting zone defined at least in part by the inner surfaces of an inductor and defining a solidification zone including said liquid/solid interface, comprising the steps of:

sensing and collecting infrared radiation within said primary casting zone emanating from at least a vertical peripheral surface at the solidification zone of said load;

computing a temperature gradient along the vertical peripheral surface of said load from the sensed and collected infrared radiation; and

providing a signal representative of the position of the li-

quid/solid interface in response to a change in the temperature gradient.

4,446,909

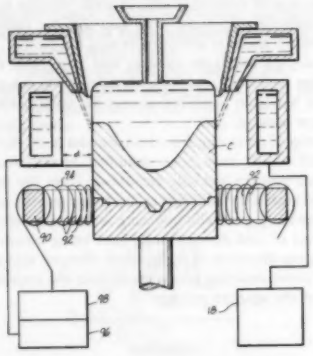
PROCESS AND APPARATUS FOR ELECTROMAGNETIC CASTING OF MULTIPLE STRANDS HAVING INDIVIDUAL HEAD CONTROL

John C. Yarwood, Madison; Gary L. Ungarean, Woodbridge; Peter J. Kindlmann, Guilford, and Derek E. Tyler, Cheshire, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 236,386, Feb. 20, 1981, abandoned. This application Jun. 7, 1983, Ser. No. 501,941

Int. Cl.³ B22D *11/01, 27/02*

U.S. Cl. 164—453 **8 Claims**



1. In an apparatus for casting molten material into an ingot of desired shape comprising:

means for receiving and electromagnetically forming said molten material into said desired shape, said receiving and forming means including:

an inductor disposed about a longitudinal axis in the direction of casting for applying a magnetic containment force field to contain the molten material, said inductor in operation, being spaced from said molten material by a gap extending from the surface of the molten material to the opposing surface of the inductor, and

means for supplying a current to the inductor to generate the magnetic containment field; the improvement comprising:

means for sensing an electrical parameter of said inductor which varies with the magnitude of the gap,

means responsive to the sensing means for generating an error signal which is a function of the difference between the sensed value of said electrical parameter and a predetermined value thereof,

means responsive to said error signal generating means for varying the magnetic containment force field applied to said molten material by redistributing the current in said inductor so as to drive said error signal towards zero, and

said containment force field varying means comprising: a core of variable permeability having laminated construction to prevent current flow therethrough, said core further being arranged in surrounding relation to the casting axis and adjacent said inductor, control winding means about said core for varying the permeability of said core, and means for supplying a variable control current to said control winding means in response to said error signal so that an increase in the control current reduces the available permeability of the core and decreases the flux linkage with magnetic fluxes generated by said inductor resulting in a redistribution of the current in the inductor away from said core and a decrease in the control current increases the available permeability of the core and the flux linkage with magnetic fluxes generated by said inductor resulting in a redistribution of the current in the inductor closer to said core whereby variations in said gap are minimized.

7. A process for casting molten material into an ingot of desired shape, comprising the following steps:

receiving and electromagnetically forming said molten material into said desired shape, said step of receiving and forming including the steps of:

providing an inductor disposed about a longitudinal axis in the direction of casting for applying a magnetic containment force field to contain the molten material, said inductor in operation, being spaced from said molten material by a gap extending from the surface of the molten material to the opposing surface of the inductor, and

supplying a current to the inductor to generate the magnetic containment field; the improvement comprising the steps of:

sensing an electrical parameter of said inductor which varies with the magnitude of the gap,

generating an error signal which is a function of the difference between the sensed value of said electrical parameter and a predetermined value thereof,

varying the magnetic containment force field applied to said molten material by redistributing the current in said inductor so as to drive the error signal towards zero,

said step of varying the magnetic containment force field, comprising the steps of:

providing a core of variable permeability having laminated construction to prevent current flow therethrough,

positioning said core in surrounding relation to the casting axis and adjacent said inductor,

providing a control winding about said core,

supplying a variable control current to said control winding in response to said error signal so that an increase in the control current reduces the available permeability of said core and decreases the flux linkage with the magnetic fluxes generated by said inductor resulting in a redistribution of the current in the inductor away from said core and a decrease in the control current increases the available permeability of the core and the flux linkage with magnetic fluxes generated by said inductor resulting in a redistribution of the current in the inductor closer to said core whereby variations in said gap are minimized.

4,446,910

TWO-PHASE THERMAL STORAGE MEANS AND METHOD

Russell S. Miller, Saratoga; Peter W. Dietz, Delanson, both of N.Y., and Christopher Bray, Chillicothe, Ill., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 152,423, May 22, 1980, abandoned. This application Mar. 1, 1982, Ser. No. 353,684

Int. Cl.³ F28D *17/00, 21/00*

U.S. Cl. 165—1 **18 Claims**

1. A two phase thermal storage method comprising the steps of:

providing a temperature-sensitive phase transformation storage material having a phase-dependent variable density;

contacting an immiscible heat transfer liquid with said storage material;

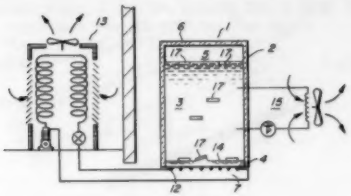
storing heat in the liquid phase of said storage material by heating said heat transfer liquid to a temperature above the temperature of storage material contacting said heat transfer liquid whereby heat stored in said storage material is increased; and

removing said stored heat by cooling said heat transfer liquid to a temperature below the liquid-to-solid phase-transformation temperature of said storage material whereby at

least a portion of said storage material is solidified at the interface with said heat transfer fluid, and removing solidified storage material from said interface by bouyancy forces;

wherein said heat transfer liquid may be cooled by circulating a quantity of heat transfer liquid from the interface with said storage material through a heat exchange relationship with a coolant and returning said quantity of liquid to said interface,

and further wherein said heat transfer liquid may be heated by circulating a quantity of the heat transfer liquid from the interface with said storage material through heat exchange relationship with a source of heat and returning said quantity of liquid to said interface.



4,446,911

REGENERATIVE PREHEATER FOR TWO SEPARATE GAS STREAMS

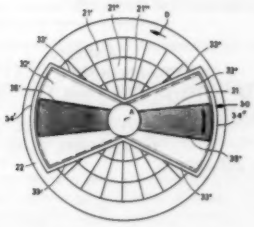
H. Reidick, Oberhausen; R. Leithner, Neuhausen; F. J. Kirchhoff, Olpe; E. Puritz, Dahlbruch, and S. Schlüter, Wenden, all of Fed. Rep. of Germany, assignors to Apparatebau Rothemühle Brandt & Kritzler GmbH, Wenden, Fed. Rep. of Germany

Filed Oct. 12, 1982, Ser. No. 433,677

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1981, 3140406

Int. Cl.³ F28D *17/00*

U.S. Cl. 165—4 **8 Claims**



1. A regenerative air preheater comprising:

a heat-exchange sector plate centered on an axis and formed with a multiplicity of axially throughgoing passages;

intake and output heating-gas hoods axially flanking the plate;

conduit means for passing a heating gas from the intake hood through the plate to the output hood for heating the plate;

intake and output secondary heated-gas hoods each within one of the heating-gas hoods and axially flanking the plate, the secondary hoods being axially aligned with each other and only covering a portion of the plate, whereby the heating gas can pass through the plate only around the plate portion covered by the secondary hoods;

conduit means for passing a secondary stream of a gas to be heated from the intake secondary hood through the plate at the plate portion covered by the secondary hoods to the output secondary hood;

drive means for rotating the secondary hoods synchronously with each other about the axis in a predetermined rotational sense, whereby the heating gas will heat regions of the plate not covered by the secondary hoods so that when same move into alignment with these heated regions the secondary gas stream will be heated;

intake and output primary heated-gas hoods within the respective secondary hoods and axially flanking the plate, the primary hoods being axially aligned with each other and only covering a subportion of the plate portion covered by the secondary hoods, whereby the secondary gas will be heated at regions of the plate portion not covered by the primary hoods;

conduit means for passing a primary stream of a gas to be heated from the intake primary hood through the plate subportion aligned with it to the output primary hood; and

control means for displacing the primary hoods at least partially nonaxially within the respective secondary hoods and thereby varying the heat-exchange between the primary stream and the plate.

4,446,912

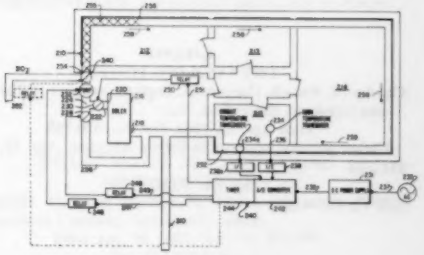
SELECTED SEGMENT HEATING OR COOLING SYSTEM

James D. Rickman, Jr., P.O. Box 272, Boxford, Mass. 01921

Filed Jan. 18, 1982, Ser. No. 340,198

Int. Cl.³ F28D *7/00*; F24D *3/02*

U.S. Cl. 165—12 **21 Claims**



1. A selected segment heating system comprising:

a source of hotter fluid;

conduit means for conducting said fluid from the outlet to the return inlet of said source of hotter fluid through a plurality of areas;

means, interconnected with said conduit, for moving said fluid through said conduit;

gauging means for controlling the operation of said means for moving to move a segment of said heated fluid in said conduit as far as the return point of the farthest area along the conduit of said areas to be heated; and

delay means for suspending operation of the means for moving for permitting a predetermined heat exchange to occur between the heating fluid and the air in the area to be heated.

4,446,913

AUTO CHANGEOVER THERMOSTAT WITH MEANS FOR HANDLING TEMPERATURE ENTRY ERRORS

Robert E. Krocker, Stoddard, Wis., assignor to The Trane Company, La Crosse, Wis.

Filed Jul. 5, 1983, Ser. No. 510,493

Int. Cl.³ F25B *29/00*

U.S. Cl. 165—12 **9 Claims**

1. A thermostat for controlling a temperture conditioning system to selectively heat or cool a comfort zone to a heating or cooling setpoint, respectively, said thermostat comprising

a. a digital keypad including a plurality of keys, each associated with an alphanumeric value;

b. memory means for storing the heating and cooling setpoints entered by an operator on the digital keypad;

c. means for displaying the heating and cooling setpoints; and

d. control means for controlling the temperature conditioning system to selectively condition the comfort zone to the heating or the cooling setpoint, said control means being connected to the digital keypad, the display means and memory means and operative to automatically maintain at least a predetermined offset between the heating and cooling setpoints by adjusting the value of one of the setpoints as the other setpoint is entered by the operator, and displaying the adjusted value to the operator to alert him of the change, so that the adjusted value may either be entered into the memory means or changed by the operator.

4,446,914

DRY COOLING TOWER

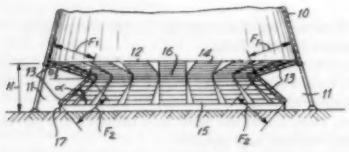
Charles M. Russell, Harpenden, England, assignor to The Lummus Company, Bloomfield, N.J.

Filed Apr. 22, 1982, Ser. No. 370,765

Claims priority, application United Kingdom, Apr. 23, 1981, 8112658

Int. Cl.³ F28D *1/04*

U.S. Cl. 165—125 **17 Claims**



1. A cooling tower comprising a hollow tower open at the upper end for the discharge of heated air, an air inlet for introducing air at the lower peripheral wall of the tower, and a plurality of heat exchange assemblies mounted within the tower comprising a lower set of heat exchangers comprising heat exchange surfaces positioned in a substantially horizontally extending array about the air inlet on a circle concentric to the peripheral wall of the tower and an upper set of heat exchangers adjoining said lower set of heat exchangers comprising heat exchange surfaces positioned in a substantially horizontal plane and extending above the tops of said lower set of heat exchangers in the annular air passage between said tops and the wall of said hollow tower, the configuration of the heat exchange surfaces of said upper and lower sets of heat exchangers being V-shaped, said upper set of heat exchangers extending downwardly from the upper end of the air inlet of the tower to define an angle θ to the horizontal, said lower set of heat exchangers extending in a direction downwardly from said upper set toward the ground to define an angle α with the horizontal or the ground, and the relationship between the height of the air inlet (H) and the length (F_{45}, and angle α ranging from about 20° to about 60°.

4,446,915

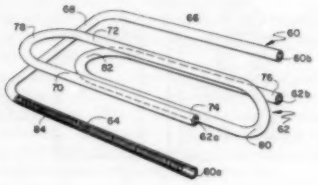
HEAT EXCHANGER TUBE CIRCUITS

Donald C. Welch, and Christopher P. Yoerg, both of La Crosse, Wis., assignors to The Trane Company, La Crosse, Wis.

Filed Apr. 14, 1982, Ser. No. 368,349

Int. Cl.³ F28D *7/08*; F28F *1/32*

U.S. Cl. 165—144 **20 Claims**



1. A multi-row heat exchanger coil having a plurality of substantially horizontal, vertically separated, circuits, each circuit comprising first and second multi-row substantially horizontal conduits, each conduit having a plurality of tubes extending the length of the heat exchanger and having interconnecting end sections disposed between the tubes for providing a continuous path of flow communication between the tubes in each conduit; said first conduit having fewer tubes than said second conduit, and having an even number of tubes at least as great as two; said second conduit having an even number of tubes at least as great as four; one tube of each of said first and second conduits forming inlet tubes for fluid to flow into said first and second conduits, and another of the tubes of each of said first and second conduits forming outlet tubes for fluid to flow from said first and second conduits; said inlet tube of the first conduit being disposed adjacent said inlet tube of the second conduit in the assembled coil, and said outlet tube of the first conduit being disposed adjacent said outlet tube of the second conduit in the assembled coil; at least one row of said heat exchanger coil being entirely comprised of inlet tubes, and another row of said heat exchanger coil being entirely comprised of outlet tubes.

4,446,916

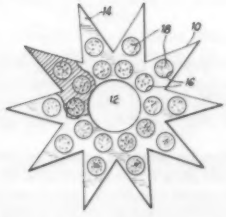
HEAT-ABSORBING HEAT SINK

Claude Q. C. Hayes, 7980 Linda Vista Rd. #49, San Diego, Calif. 92111

Filed Aug. 13, 1981, Ser. No. 292,639

Int. Cl.³ H01L *23/42*

U.S. Cl. 165—185 **12 Claims**



1. An improved heat sink device for transferring heat from a heat generator to lower-temperature surroundings by radiation, covection, and conduction, wherein the improvement comprises: a device-embedded compound that absorbs heat at a specific temperature, delaying temperature rise in the heat generator; and a multiplicity of fibers to absorb and retain said compound within the device, both below and above said specific temperature, said fibers being partially exposed as an

outer surface of the device providing heat transfer by radiation and convection.

4,446,917

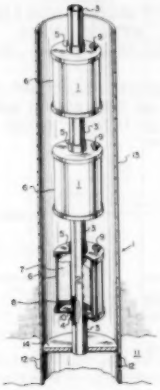
METHOD AND APPARATUS FOR PRODUCING VISCOUS OR WAXY CRUDE OILS

John C. Todd, 10646 Marguis, Dallas, Tex. 75229

Continuation-in-part of Ser. No. 948,434, Oct. 4, 1978,. This application Mar. 12, 1979, Ser. No. 19,579

Int. Cl.³ E21B *36/02*

U.S. Cl. 166—59 **4 Claims**



1. Apparatus for heating crude oil within production tubing in a wellbore comprising:

a first conduit adapted for connection at both ends to said production tubing to provide a continuous flow path for crude oil through said tubing and first conduit,

a second conduit larger than said first conduit, spaced concentrically about said first conduit,

upper and lower collars connecting said first and second conduits together,

a porous plug closing the bottom of the annulus between said first and second conduits,

a catalyst bed positioned in the annulus between said first and second conduits above said porous plug,

a gas lift valve carried by said upper collar for conducting a combustion gas containing both a fuel and oxygen to said catalyst bed, and

port means for providing communication between said annulus below said porous plug and the interior of said first conduit, whereby products of combustion from said catalyst bed are conducted into the first conduit.

4,446,918

METHOD FOR INITIATING COMBUSTION IN A SUBTERRANEAN CARBONACEOUS DEPOSIT

Herbert B. Wolcott, Jr., Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 8, 1982, Ser. No. 366,510

Int. Cl.³ E21B *43/247, 43/30*

U.S. Cl. 166—245 **4 Claims**

1. A method for initiating combustion in a subterranean coal deposit penetrated by a plurality of wellbores, said method consisting essentially of:

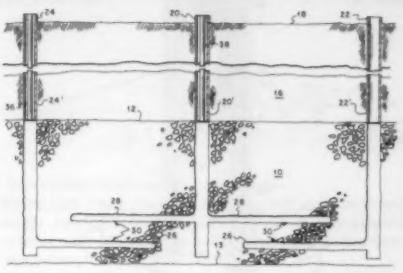
(a) penetrating said coal deposit with a first wellbore;

(b) positioning a plurality of other wellbores about said first wellbore, each of said other wellbores having at least one substantially horizontal borehole extending therefrom into the vicinity of said first wellbore;

(c) extending a plurality of substantially horizontal boreholes from said first wellbore into the vicinity of said other wellbores

(d) positioning explosive charges in at least a portion of said boreholes;

(e) detonating said explosive charges to produce a rubblized zone between said first wellbore and said other wellbores



(f) igniting said coal deposit in at least one of said wellbores; and

(g) injecting a free-oxygen containing gas into said coal deposit through at least one of said wellbores to gasify said coal deposit in situ and produce gasification products.

4,446,919

ENHANCED OIL RECOVERY USING MICROORGANISMS

Donald O. Hitzman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 26, 1982, Ser. No. 371,770

Int. Cl.³ E21B *43/22*

U.S. Cl. 166—246 **15 Claims**

1. A process for the recovery of oil from an oil-bearing subterranean reservoir comprising the steps of:

(a) injecting carbon dioxide into the oil-bearing reservoir under conditions effective for extracting sulfur- and/or nitrogen-containing compounds from the oil;

(b) injecting an aqueous solution of at least one carbon dioxide-tolerating microorganism into the carbon dioxide-containing reservoir; and

(c) maintaining the carbon dioxide pressure in the microorganism-containing reservoir so as to extract nitrogen- and/or sulfur-containing nutrients for microorganism growth from the oil into the aqueous solution, the microorganism growth producing surface active agents which promote the release of oil from the reservoir.

4,446,920

METHOD AND APPARATUS FOR PERFORATING OR CUTTING WITH A SOLID FUELED GAS MIXTURE

Andrew J. Woytek, Allentown; John T. Lileck, Tamaqua, and Edward J. Steigerwalt, Lehighton, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

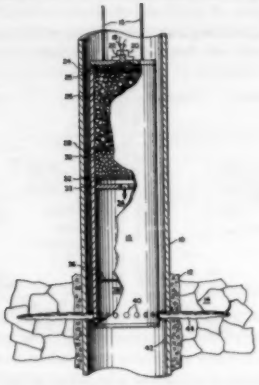
Filed Jan. 13, 1983, Ser. No. 457,815

Int. Cl.³ E21B *29/02*

U.S. Cl. 166—297 **27 Claims**

1. A method of cutting in which a highly reactive gas mix-

ture of fluorine and nitrogen trifluoride is used to perform the cutting action wherein the gas mixture is supplied at high



pressure by the rapid decomposition of a solid, normally stable, perfluoroammonium salt.

4,446,921

METHOD FOR UNDERGROUND GASIFICATION OF SOLID FUELS

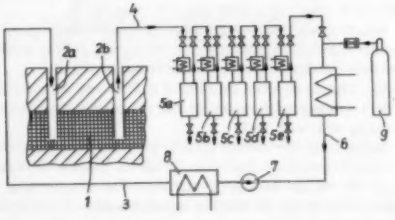
Hubert Coenen, and Ernst Kriegel, both of Essen, Fed. Rep. of Germany, assignors to FRIED. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Mar. 16, 1982, Ser. No. 359,171

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1981, 3111137

Int. Cl.³ E21B *43/22, 43/24, 43/40*

U.S. Cl. 166—267 **5 Claims**



1. In a process for underground gasification of a solid fuel in which the solid fuel, which is present under the earth's surface, is initially opened up and then converted into a gaseous fuel by means of a chemical reaction with a gasification medium, the improvement comprising: opening up the solid fuel underground by treating the solid fuel with a gas which is in the supercritical state to dissolve the volatile organic compounds and water contained in the solid fuel in the supercritical gas and form a charged supercritical gas phase, the gas which is in the supercritical state having a temperature of 10° to 100° C. above its critical temperature and a pressure of 2 to 300 bar above its critical pressure when it enters the fuel deposit, and separating the dissolved organic compounds and the dissolved water from the charged supercritical gas phase above ground in at least two fractions by pressure reduction and/or a change in temperature.

4,446,922

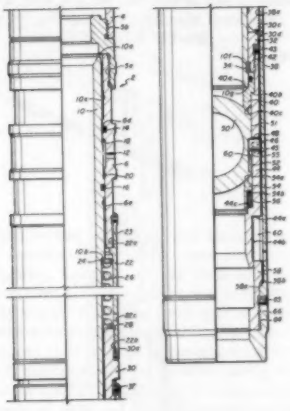
ADJUSTABLE SAFETY VALVE

Michael L. Bowyer, and Drummond Whiteford, both of Aberdeen, Scotland, assignors to Baker Oil Tools, Inc., Orange, Calif.

Filed Jun. 16, 1982, Ser. No. 388,846

Int. Cl.³ E21B *34/10*

U.S. Cl. 166—322 **16 Claims**



11. A safety valve for automatically closing a fluid transmission conduit in a subterranean well in response to a change in the pressure differential between a control fluid pressure and the well pressure below the valve, comprising:

a valve cage axially reciprocal between a first position and a second position in response to an increase in control fluid pressure and comprising a unitary member having tubular upper and lower sections on opposite sides of an opening in the side of the cage;

a ball valve element having a flow passage therethrough, the ball valve element being insertable through the cage opening;

pivot means for attaching the ball valve element to the cage to permit rotation of the ball valve element in the cage about a transverse pivot axis from a closed to an open position; and

a base member movable relative to the cage and having an axially extending member engaging the ball valve element at a point offset from the pivot axis to impart rotation of the ball valve element upon movement of the cage from the first to the second position.

4,446,923

REMOVAL OF EXPLOSIVE OR COMBUSTIBLE GAS OR VAPORS FROM TANKS AND OTHER ENCLOSED SPACES

Roy T. Martin, Kingston-Upon-Thames, England, assignor to Walter Kidde & Co., Inc., Wake Forest, N.C.

Continuation of Ser. No. 34,566, Apr. 30, 1979, abandoned, which is a continuation-in-part of Ser. No. 733,337, Oct. 18, 1976, abandoned, which is a continuation-in-part of Ser. No. 478,223, Jun. 11, 1974, abandoned. This application Jun. 9, 1981, Ser. No. 272,040

Int. Cl.³ A62C *1/14, 1/12, 3/12, 1/02;* **A62D** *1/02*

U.S. Cl. 169—45 **12 Claims**

1. A method of purging an enclosed space of a gaseous flammable substance comprising:

(a) forming a foam from (i) a liquid consisting essentially of water and a foaming agent and (ii) a human life-supporting, fire-suppressing gaseous mixture consisting essentially of predetermined quantities of air and a low-toxicity fire-suppressant gaseous substance, said gaseous mixture filling

the bubbles of said foam, said foam being capable of decaying;

(b) introducing said foam into said enclosed space, thereby displacing said flammable substance; and

(c) allowing the foam to decay in said enclosed space.

4,446,924

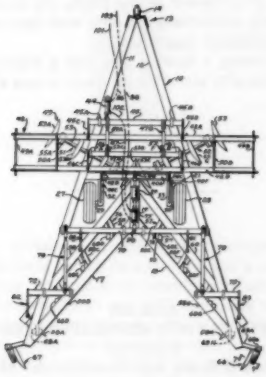
HIGH SPEED TILLAGE SYSTEM WITH DISCS AND PLOW POINTS

William J. Dietrich, Sr., Congerville, Ill., assignor to DMI, Inc., Goodfield, Ill.

Continuation of Ser. No. 150,730, May 19, 1980, abandoned. This application Nov. 22, 1982, Ser. No. 443,849

Int. Cl.³ A01B *13/08*

U.S. Cl. 172—140 **23 Claims**



1. Apparatus for tilling soil adapted to operate at ground speeds in excess of about 4½ miles per hour, comprising: frame means; support wheel means for supporting said frame means; a first set of discs carried by said frame means for tilling the soil, each disc of said first set being widely laterally spaced relative to adjacent discs of said first set to leave alternate strips of tilled and untilled ground having substantial width; a second set of discs carried by said frame means, the discs of said second set being widely laterally spaced relative to adjacent discs of said second set and located rearwardly and laterally of the discs of said first set to till said strips of untilled soil left by said first set, the leading edges of associated pairs of discs, of said first and second sets respectively overlapping in the range of about ½ to 2 inches, the discs of both sets having diameters greater than about 24 inches and set at a working angle in the range of about 27°–35°; a plurality of plow points carried by said frame means, each point located directly behind an associated disc of said second set to form a disc/point pair therewith, and arranged to till soil in the furrow formed by said associated disc at a depth greater than the working depth of said associated disc, each disc of said second set, other than a leading disc, being located rearwardly of the adjacent disc of said second set which is displacing soil in the same direction and arranged to throw soil laterally into the furrow formed by the adjacent forward disc and its associated plow point and into the furrow formed by a disc of said first set, whereby substantially all of the soil in a swath traversed by said apparatus is tilled in a single pass of said apparatus without leaving strips of substantial overlap, and said apparatus leaves the soil substantially free of ridges and furrows.

4,446,925

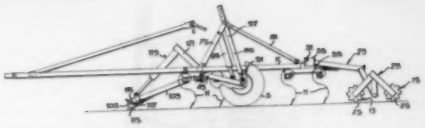
SOIL CULTIVATING MACHINE

Bertrand Vachon, Thetford Mines, Canada, assignor to Ber-Vac Inc., Quebec, Canada

Filed Jan. 15, 1982, Ser. No. 339,781

Int. Cl.³ A01B *35/18, 63/22*

U.S. Cl. 172—142 **13 Claims**



1. In a cultivator of the type including:

a frame, said frame having a drawing end and a rear end;

a single pair of wheels rotatable about an axis extending transversely of said frame with respect to the direction of displacement of the cultivator;

at least one transverse row of tines mounted on the frame forwardly of the wheel axis;

at least one other transverse row of tines rearwardly of the wheel axis;

at least one transverse cylindrical rolling harrow;

means for mounting said rolling harrow on said frame at said rear end thereof behind the rearward row of tines for oscillation about an axis parallel to the longitudinal axis of said rear harrow; and,

means for resiliently biasing said rear harrow downwardly, the improvement comprising:

said frame having a pair of parallel cross-members disposed on either side of the wheel axis and at least two longitudinal members joining said cross-members; and

mounting means along either side of said frame for mounting said wheels onto said frame, said mounting means being comprised of:

a wheel leg pivotally mounted at one end to said frame for oscillation in a vertical plane beneath said frame;

axle means at the other end of said wheel leg for mounting one of said wheels thereon, said wheel mounted on said axle means being freely rotatable about its axis,

a plurality of braces, each brace being connected to the other at one end thereof and each brace being connected at the other end thereof to one of said cross-members, whereby a vertically extending triangular structure is formed,

power jack means connecting one of said braces to said wheel leg for oscillating said wheel leg, whereby said wheel and frame are displaced relative to each other, and

an upwardly extending telescoping assembly means connecting said braces and said wheel leg for controlling the vertical position of said frame and thereby the cultivation depth of said cultivator, said assembly comprising:

a hollow tubular member have a series of holes therethrough at one end, said holes being spaced in pairs therealong,

a rod freely slidable within said hollow tubular member,

a lock pin removably extending through a selected one of said pairs of holes, whereby said rod is prevented from sliding in said tubular member past said lock pin,

first connecting means for connecting the upper end of said hollow tubular member to the apex of said vertically extending triangular structure, and

second connecting means at the lower end of said rod for connecting said rod to said wheel leg,

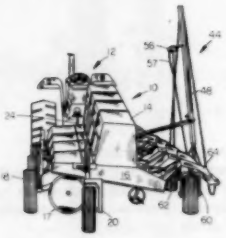
whereby upon release of pressure in from said power jack means and the consequent lowering of said frame, said rod rises in said hollow member until it butts against said lock pin and thus prevents further downward movement of said frame, whereby the depth of tillage of said cultivator is controlled.

4,446,926

MULTIPLE UNIT AGRICULTURAL DEVICE AND TRANSPORT SYSTEM THEREFOR

Milford D. Hoaglen, 836 Logan Ave., Grant, Nebr. 69140

Filed Aug. 11, 1981, Ser. No. 291,972
Int. Cl.³ A01B *73/00*
U.S. Cl. 172—240 **17 Claims**



1. In combination with longitudinally connected multiple unit agricultural equipment of a type wherein the direction of travel in the operating mode is transverse to the longitudinal axis of the equipment and the direction of travel in the transport mode is parallel to the longitudinal axis of the equipment and wherein each unit of said equipment has a frame with a generally rectangular periphery consisting of a forward side, an aft side parallel to said forward side, an operating side, and a back side parallel to said operating side; a transport device comprising:

(a) operating hitch means connected to the operating sides of said units;

(b) transport hitch means connected to the forward side of the forwardmost unit;

(c) castor wheel means mounted on the operating sides of said units; and

(d) hydraulically retractable transport wheel means mounted on the back sides of said units and each comprising

(1) a hydraulic cylinder means having a first end and a second end wherein said first end is attached to the back side of the frame of an associated unit about a first pivot axis; and

(2) an elongated spindle arm extending lengthwise transverse to the longitudinal axis of the associated unit, said spindle arm being mounted to said associated unit independently of the spindle arms associated with the other units, and having a first end and a second end wherein a spindle and transport wheel are mounted at said first end of said spindle arm and wherein said second end of said spindle arm is mounted about a second pivot axis attached to the frame of said associated unit and wherein said spindle arm is pivotally attached at said second end thereof to said second end of said hydraulic cylinder means about a third pivot axis; said first pivot axis, said second pivot axis and said third pivot axis being substantially parallel to the longitudinal axis of said associated unit.

4,446,927

GROUND PENETRATING TOOL FOR FARM IMPLEMENT SHANKS

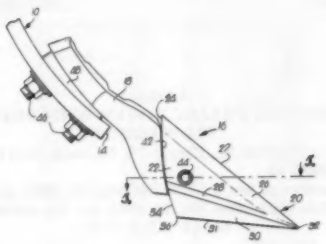
Forrest E. Robertson, Garden City, Kans., assignor to Acra-Plant, Inc., Garden City, Kans.

Filed Mar. 1, 1982, Ser. No. 356,306
Int. Cl.³ A01B *15/02*
U.S. Cl. 172—753 **12 Claims**

1. In a farm implement provided with an elongated, downwardly and forwardly inclined shank having a terminus, a ground penetrating tool for said shank, said tool comprising:

an elongated, downwardly and forwardly inclined mount having means for securing the same to the shank at said terminus with the mount extending downwardly and forwardly from the shank;

an elongated, essentially pyramidal downwardly and forwardly inclined tooth extending downwardly and forwardly from said mount,



the angles of inclination of the shank, the mount and the tooth being substantially the same with their longitudinal axes in substantial alignment,

said tooth having a leading apex and a trailing end; and

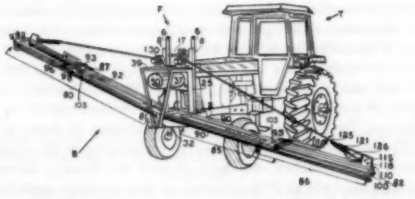
means releasably attaching the tooth to said mount.

4,446,928

BOOM WITH ENERGY ABSORBING VIBRATION DAMPER

Leon C. McClure, R.R. #2, Box 78, and Stanley McClure, Sr., R.R. #2, Box 161, both of Jamestown, Ky. 42629

Division of Ser. No. 177,166, Aug. 18, 1980, Pat. No. 4,320,595.
This application Feb. 16, 1982, Ser. No. 349,343
Int. Cl.³ A01B *73/00*
U.S. Cl. 172—776 **1 Claim**



1. An elongated boom and a frame, said elongated boom having a proximal end and a distal end and which is pivotably connected at its proximal end in cantilever fashion to said frame for vertical movement of said boom through an arc from a horizontal position to a vertical position, the improvement of an energy absorbing vibration damper comprising in combination:

A. a non-rotatable sheave mounted at the distal end of the boom;

B. a cable operatively connected at the proximal end to said frame and looped around said non-rotatable sheave at the distal end of said boom; and

C. a coil spring attached at one end to the free end of said looped cable and at the other end to the body of the cable.

4,446,929

FLUID OPERATED ROCK DRILL HAMMER

Dan L. Pillow, Garland, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jun. 11, 1979, Ser. No. 47,417
Int. Cl.[3] E21B 4/14; E21C 7/00
U.S. Cl. 173—17 1 Claim

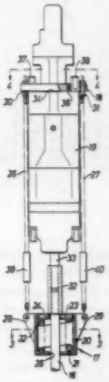
1. A fluid operated rock drill hammer, comprising:
an annular body having an upper end and a lower end;
a drill chuck mounted at the lower end of said body;
a drill bit connected to said drill chuck and extending into said body, said drill bit moveable in said drill chuck from a drilling position to a bypass position;
a tubular fluid feed tube mounted in said body and extending from said upper end toward the drill chuck;
a first set of apertures in said feed tube;
a second set of apertures in said feed tube;
a piston slidably mounted in said body ositioned around said feed tube to move between the drill bit at the lower end for striking the drill bit and the upper end of said body, said piston having an upper surface and a lower surface;
a first passageway in said piston communicating from the lower surface of the piston to said first set of apertures in the feed tube when the piston is in abutting relationship with the drill bit and the drill bit is in drilling position to admit fluid into the space between the piston and drill bit to drive the piston upward;
a second passageway in said piston communicating from the upper surface of the piston to said second set of apertures in said feed tube when the piston is at its upper position in the body to admit fluid between the piston and the upper end of the body to drive the piston downward; and
a separate fluid passage in said piston providing fluid communication between said first set of apertures and said upper surface of said piston when said piston is abutting said drill bit in a by-pass position to provide pressurized fluid to said upper surface; and
a separate restricted exhaust opening in said tube and said second passageway providing fluid communication between the upper surface of said piston and said restricted opening when said drill bit is in said by-pass position to restrict exhaust of pressurized fluid from adjacent said upper surface and thereby maintain a higher pressure on said upper surface.

4,446,930

DRILL STEEL REMOVAL ATTACHMENT FOR ROCK DRILLING MACHINE

Hans Gösta Nilsson, and Kurt A. G. Nilsson, both of Tyresö, Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Oct. 25, 1982, Ser. No. 436,397
Claims priority, application Sweden, Nov. 26, 1981, 8107060
Int. Cl.[3] B25D 17/00
U.S. Cl. 173—29 9 Claims



1. Drill steel withdrawing attachment for a percussive rock drilling machine (12) of the kind which is displaceable along a feed beam (14) by a feeding device, said drill steel withdrawing attachment being arranged for applying a rearward feed force to drill steels to withdraw drill steels (16) which are stuck in a drilled hole, the drill steel withdrawing attachment comprising:
a spring housing (17);
a flexible means (26,27) coupled to said spring housing (17) for movably suspending said spring housing (17) from the drilling machine (12) with said spring housing in front of said drilling machine (12) such that said drill steel (16) passes through said spring housing (17);
a compression spring (22) located in said spring housing (17); and
a stopping member (23) coupled to said spring housing (17) and acting as a reflector for the blows of the drilling machine (12), said stopping member (23) being supported by said spring (22) in said spring housing (17) so as to be in an abutment position against the drill steel (16) via an extension sleeve (32) or the like on said drill steel (16).

4,446,931

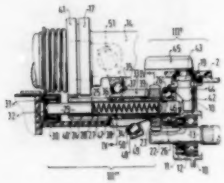
POWER DRIVEN HAMMER DRILL

Manfred Bleicher, Leinfelden; Manfred Buck, Filderstadt; Jörg Fälchle, Bempflingen, and Karl Wanner, Leinfelden-Echterdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 14, 1981, Ser. No. 302,112
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1980, 3039669
Int. Cl.[3] B23B 45/16; B25D 16/00
U.S. Cl. 173—48 22 Claims

1. A power driven hammer drill, comprising a housing having an axis; a tool striking means arranged to reciprocate in said housing; drive means including a wobble unit with a limitably axially displaceable drum member and a transmitting member reciprocating said tool striking means, a drive motor formed as an electric motor with a pinion, an intermediate shaft having a passage and rotatable by said drive motor, a driving gear arranged on said intermediate shaft in non-rotatable and axially displaceable manner relative thereto and engageable with said

pinion of said electric motor, means for releasably coupling said intermediate shaft with said drum member of said wobble unit and including a first coupling element provided on said drum member and a second coupling element provided on said intermediate shaft and positively engageable with said first coupling element of said drum member, a bearing which transmits axial forces, supports said intermediate shaft and has an inner ring, spring means arranged to act so as to bring said second coupling element of said intermediate shaft into interengagement with said first coupling element of said drum member, said spring means including a spring element accommodated in said passage of said intermediate shaft and prestressing the latter with an axial abutment against said drum member in engaged condition, whereas said drum member axially abuts said driving gear, and said driving gear abuts against said inner ring of said bearing; and switch means located outside of said housing and arranged so as to disengage said second coupling element of said intermediate shaft out of said first coupling element of said drum member against the action of said spring means.



4,446,932

HYDROSTATIC SHEAR PIN

James Hipp, New Iberia, La., assignor to Petro-Drive, Inc., Lafayette, La.

Filed Apr. 24, 1981, Ser. No. 257,257
Int. Cl.³ E21B 7/06
U.S. Cl. 175—74 **10 Claims**

1. An apparatus for selectively restraining and releasing relative rotational movement of a first component connected to a second component, comprising:

(a) a housing mounted in the first component, having an internal recess opening towards the second component;

(b) a plug having a first portion slidingly engaged and constrained within the recess of the housing, but not fully occupying the space therein, defining an inner surface of the plug facing the recess, and having a second portion projecting beyond the housing and the first component so as to engage in an aligned hole in the second component when the plug is fully extended with respect to the housing, said second portion defining an outer surface of the plug;

(c) conduit means for exposing the outer surface of the plug to ambient fluid pressure so as to tend to retract the plug into the recess;

(d) locking means for restraining the retracting of the plug until the force exerted by the ambient fluid pressure equals or exceeds the precalculated level, whereupon the locking means will disengage, allowing the plug to retract into the recess, thereupon permitting relative rotational movement of the first component with respect to the second component;

(e) said locking means comprising a plurality of rigid pins mutually engaging radially aligned holes in the retracting plug and housing, said rigid pins so constructed and arranged as to break at the application of the precalculated force acting upon the outer surface of the plug,

(f) said locking means further including a quantity of pressurized gas sealed within the remaining space of the recess of the housing,

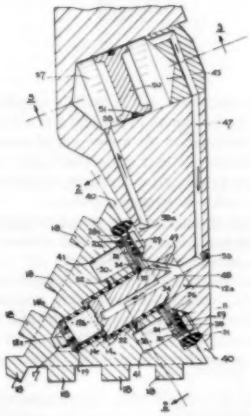
(g) said housing further including a shoulder in the recess, said shoulder being of larger diameter than the recess, so as to allow the pressurized gas within said recess and shoulder to escape when said plug retracts fully into said shoulder.

4,446,933

ROTARY EARTH BORING DRILL BIT WITH CENTRIFUGAL LUBRICATION SYSTEM

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Filed Mar. 29, 1982, Ser. No. 362,886
Int. Cl.³ E21B 10/22
U.S. Cl. 175—229 **5 Claims**



1. In a rotary drilling bit mechanism having a shaft and bearing means lubricated by a lubricant for supporting said mechanism for rotation on said shaft, the improvement being means for supplying lubricant to said bearing means in response to the centrifugal force generated with said rotation comprising

first cavity means formed in the body of said mechanism for storing the lubricant,

first channel means for providing fluid communications between said first cavity means and said bearing means,

second cavity means formed in the body of said mechanism,

fluid drive means interposed between said first and second cavities for driving lubricant from the first cavity means through channel means to said bearing means in response to a pressure differential between said first and second cavity means,

fluid containing means located further radially outwardly from the rotation axis of said drilling bit mechanism than said bearing means such that with rotation of said bit, the centrifugal force generated at said fluid containing means is greater than that generated at said bearing means, and

second channel means for providing fluid communication

between said second cavity means and said fluid containing means,

a pressure differential being developed between said first and second cavities in response to the difference between the centrifugal force generated at said bearing means and said fluid containing means with the rotation of said bit mechanism, thereby causing the fluid drive means to drive lubricant to said bearing means.

4,446,934

BORING TOOL FOR RADIAL ENLARGEMENT OF A CYLINDRICAL FOUNDATION BORE

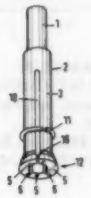
Norbert Müller, Wolpertswende, Fed. Rep. of Germany, assignor to Hawera Probst GmbH & Co., Ravensburg, Fed. Rep. of Germany

Filed Jun. 23, 1982, Ser. No. 391,160

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1981, 3126472

Int. Cl.³ E21B *10/32*

U.S. Cl. 175—286 **14 Claims**



1. A boring tool for radially enlarging a cylindrical foundation bore which has a bottom, said tool being intended for rotary-blow operation and use with a prime mover; said tool in combination comprising:

a tubular cylindrical tool body having a first end and a second end, said first end being provided with a tool shank for insertion in said prime mover; said tool body including resilient segments separated from each other by radially extending slots defining openings extending radially thereof, one end of said segments forming said second end of said tool body, which respectively extend in the axial direction of said tool body, and which delimit between one another longitudinal slots which are open toward said second end of said tool body;

radially adjustable cutting elements securely connected to the second end of said tool body located coaxially therewith and projecting peripherally as arranged on said radially spreadable segments of said second end of said tool body for effecting said enlargement of said foundation bore, each cutting element having an axial working surface which extends in the circumferential direction of, i.e. substantially perpendicular to the axis of, said tool body, with those working surfaces which are adjacement to one another in the circumferential direction forming the front end face of said tool body; said cutting elements, in the starting position of said tool body, forming a substantially complete circular ring though adjustable radially such that circumferentially particularly an outermost peripheral cutting edge thereof is greater than circumference of said tool body; and

an enlarging spindle which is guided in said tool body and is adapted to be supported on said bottom of said foundation bore; said enlarging spindle, when fully entering said tool body, displacing said cutting elements radially outwardly so that said cutting elements including said resilient segments thereon after each blow exerted axially upon said tool body can spread resiliently in radial direction therefrom and returning into starting position thereafter.

4,446,935

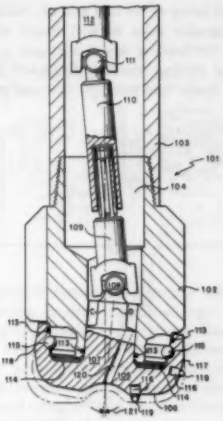
INTERMITTENT HIGH-DRAG OIL WELL DRILLING BIT

Percy W. Schumacher, Jr., Houston, Tex., assignor to Reed Tool Company (Delaware), Houston, Tex.

Continuation of Ser. No. 24,844, Mar. 28, 1979, abandoned. This application Sep. 20, 1982, Ser. No. 420,417

Int. Cl.³ E21B *4/02, 10/56*

U.S. Cl. 175—329 **7 Claims**



1. A rotarty drill bit for drilling a well bore in a formation, the bit comprising:

a bit body having a threaded pin at its upper end adapted to be detachably secured to drill pipe or the like for rotating the bit body;

a cutter head rotatably mounted on the bit body at the bottom thereof, said cutter head comprising a cutter body of generally circular shape in transverse section having a bottom and a side wall extending up from the bottom, and a plurality of drag cutting elements mounted on and projecting from said bottom and side wall of the cutter body, with the cutting elements on the bottom of the cutter head being engageable with the bottom of the well bore and the cutting elements on the side wall being engageable with the side of the well bore, the cutter head being of slightly smaller overall diameter than the well bore and being mounted on the bit body with its axis of rotation at an angle relative to that of the bit body; and

means for interconnecting the cutter head to means for rotating the cutter head relative to the bit body, with the cutter head thus being rotatable independently of the rotation of the bit body, whereby with the bit in a well bore and upon rotation of the bit body and rotation of the cutter head relative to the bit body, each cutting element intermittently engages the formation, with only a predetermined number of the cutting elements engaging the formation at any one point in time, but with all cutting elements engaging the formation over a predetermined period of time, for enabling improved cooling of the cutting elements for extended cutting element life.

4,446,936

MINING DRILL

Vinod K. Sarin, Lexington, and Peter Oberhauser, Sudbury, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Feb. 8, 1982, Ser. No. 346,968

Int. Cl.³ E21B *10/62*

U.S. Cl. 175—410 **2 Claims**

1. A mine drill for aiding the collection of detritus during

drilling comprising a drive body being cylindrically shaped about an axis of rotation and having an axial passage for the flow of detritus, a bit mounted at the forward end of said drive body for movement about said axis of rotation, said bit comprising a body portion having a base portion with a pair of support lands projecting therefrom along an axial direction and an elongated insert having forwardly projecting cutting edges and a base surface secured to said base portion, said base surface lying in a plane substantially normal to the axis of rotation, each support land being offset said axis of rotation and secured to respective opposite sides of said insert whereby during rotation of said bit leading insert surfaces are substantially unobstructed and trailing insert surfaces are mounted to respective support lands, said insert having end portions extend-

ing in a radial direction outwardly of said base portion and said drive body, said drive body having a pair of forwardly Projecting flanges forming diametrically opposed apertures, each aperture receiving a respective end portion, each flange having a trailing land facing a respective support land for disengageably transmitting substantially all of said torsional forces to said bit during drilling, and independent means for removably holding said bit from movement in an axial direction, each flange being an extension of the tubularly shaped drive body and extending forwardly of said plane and being spaced from opposite sides of said insert to form a pair of unobstructed air passages adapted for conveyance of detritus during drilling to said axial passage, each passage being formed on an opposite side of said bit.

4,446,937

METHOD OF TREATING COMBINATION DEFECTIVENESS IN COMBINATORIAL WEIGHING OR COUNTING

Yoshiharu Asai, Kurita, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

PCT No. PCT/JP81/00193, 371 Date Feb. 23, 1982, 102(e) Date Feb. 23, 1982, PCT Pub. No. WO82/00882, PCT Pub. Date Mar. 18, 1982

PCT Filed Aug. 26, 1981, Ser. No. 355,545

Claims priority, application Japan, Sep. 3, 1980, 55-122556

Int. Cl.³ G01G *19/22*

U.S. Cl. 177—1 **12 Claims**

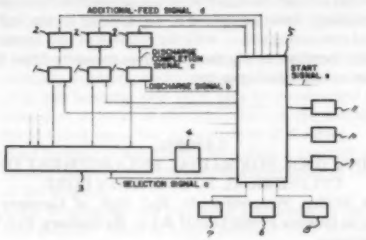
1. The process for obtaining a combination of articles of a target weight comprising the steps of:

weighing groups of articles with a plurality of weighing machines;

computing the sum weight of articles for every combination of said groups of articles;

selecting a particular combination, the sum weight of articles of which is equal to or nearest said target weight and within a preset range of allowance;

if no combination satisfies the criteria for selection, selecting at least one of said weighing machines and decreasing the



amount of the articles therein or feeding in additional fresh articles; and

repeating the same operation from the beginning.

4,446,938

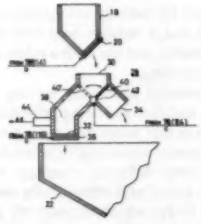
COMBINATION WEIGHING MACHINE

Shozo Kawanishi, Kobe, Japan, assignor to Yamato Scale Company. Ltd., Hyogo, Japan

Filed Jun. 10, 1982, Ser. No. 387,187

Int. Cl.³ G01G *19/22, 13/24;* B07C *5/00*

U.S. Cl. 177—25 **3 Claims**



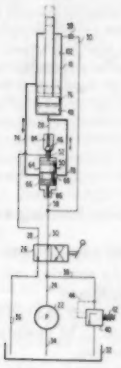
1. A combination weighing machine comprising a plurality of weighing units each having a weighing cradle for weighing articles in the cradles to produce weight signals indicative of the weights thereof, a common collection hopper, a combination selection circuit coupled for receiving said weight signals for summing said weight signals in accordance with predetermined mathematical combinations and selecting a combination having a sum which satisfies a predetermined condition to produce outputs specifying those of said weighing cradles belonging to said selected combination, first gate means responsive to said outputs for transferring the contents of said specified weighing cradles to said common collection hopper the improvement comprising at least one auxiliary hopper associated with each weighing unit, a memory associated with said auxiliary hopper for supplying its content to said combination selection circuit to cause it to participate in said combinations together with said weight signals from said weighing cradles, switching means for coupling temporarily the output of said weighing unit to the input of said memory to write said weight signal in said memory, second gate means for transferring the content of said weighing cradle to said auxiliary hopper associated with said memory after writing-in of said weight signal and third gate means responsive to an output of said combination selection circuit when the last said output specifies said memory for transferring the content of said auxiliary hopper to said common collection hopper.

4,446,939

TILTCAB TRUCK WITH HYDRAULIC LOST MOTION

Tone Oudelaar, Oldenzaal, Netherlands, assignor to Applied Power Inc., Milwaukee, Wis.

Filed Feb. 2, 1982, Ser. No. 345,010
Int. Cl.³ B62D 33/06
U.S. Cl. 180—89.15 22 Claims



1. In a motor vehicle comprising:

(a) a chassis member;

(b) a cab member mounted on said chassis member for pivotal movement about an axis transverse to the longitudinal axis of said chassis member from a lowered first position to a raised second position;

(c) at least one tilt cylinder operatively connected to said chassis member and to said cab member to pivot said cab member back and forth between its first and second positions;

(d) a pump for supplying hydraulic fluid under pressure to said tilt cylinders;

(e) a reservoir for hydraulic fluid;

(f) a suspension system between said chassis member and said cab member; and

(g) first means for permitting hydraulic fluid to move back and forth between the push chamber and the pull chamber of said tilt cylinder while said cab member is in its first position, thereby permitting said cab member to pivot relative to said chassis member to accommmodate vertical motion in said suspension system,

the improvement wherein said first means comprises a pilot-operated check valve having a through passageway which is a part of a hydraulic connection between the push chamber and the pull chamber of said tilt cylinder, which through passageway is only shut off when hydraulic pressure is applied to the push chamber of said tilt cylinder;

said pilot-operated check valve comprises a one-way valve and a pilot piston having a projection sized and shaped to open said one-way valve; and

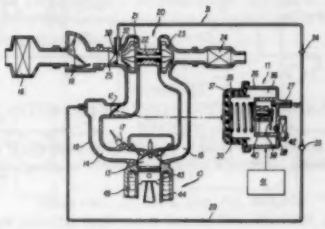
when hydraulic pressure is applied to the pull chamber of said tilt cylinder, said pilot piston is caused to open said one-way valve, but said through passageway remains open.

4,446,940

SPEED CONTROL SYSTEM FOR MOTOR VEHICLE EQUIPPED WITH TURBOCHARGER

Naoji Sakakibara, Chiryu, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 27, 1981, Ser. No. 258,032
Claims priority, application Japan, May 23, 1980, 55-68764
Int. Cl.³ F02B 67/00; B60K 31/00
U.S. Cl. 180—177 3 Claims



1. A speed control system for a motor vehicle having an internal combustion engine, a turbocharger, and an intake manifold, said speed control system comprising:

(a) a throttle valve located in said intake manifold;

(b) means for generating a signal in accordance with the difference between a selected speed of said motor vehicle and the actual speed of said motor vehicle;

(c) a vacuum actuator comprising:

(i) a casing the interior of which is divided into an atmospheric chamber and a vacuum chamber by a diaphragm, said casing having a first inlet port for introducing vacuum into said vacuum chamber and a second inlet port for introducing atmospheric air into said vacuum chamber, and

(ii) a modulating valve for selectively opening said first inlet port or said second inlet port in response to said signal, thereby modulating the pressure within said vacuum chamber;

(d) means operatively connecting said diaphragm to said throttle valve such that the opening of said throttle valve is dependent upon the position of said diaphragm;

(e) a first passage providing communication between said first inlet port and said intake manifold;

(f) a second passage providing communication between said first inlet port and the inlet end of said turbocharger;

(g) a first one-way check valve disposed in said first passage such that said first one-way check valve is open when the pressure in said intake manifold is less than the pressure in said first inlet port and closed when the pressure in said first inlet port is less than the pressure in said intake manifold; and

(h) a second one-way check valve disposed in said second passage such that said second one-way check valve is open when the pressure in the inlet end of said turbocharger is less than the pressure in said first inlet port and closed when the pressure in said first inlet port is less than the pressure in the inlet end of said turbocharger,

whereby the pressure in said first inlet port is the lower of the pressure in said intake manifold or the pressure in the inlet end of said turbocharger.

4,446,941

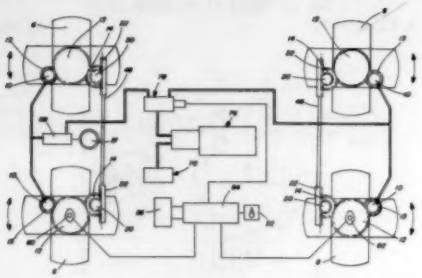
STEERING SYSTEM FOR UTILITY VEHICLE

Victor R. Laurich-Trost, 34600 McAfee Dr., Solon, Ohio 44139

Filed Sep. 18, 1981, Ser. No. 302,516
Int. Cl.³ B62K 17/30, 17/34
U.S. Cl. 180—236 6 Claims

1. A steering system for a utility vehicle having multi-steering modes of operation comprising a pair of front wheels and

a pair of rear wheels mounted on a chassis for driving movement in an angular and linear directions, motor drive means operably associated with each of said wheels for driving the said wheels in clockwise or counterclockwise directions, said front wheels being hydraulically driven and also mechanically interconnected together for synchronous turning movement



and said rear wheels being hydraulically driven and also mechanically interconnected together for synchronous turning movement, and electrical control circuit means operably coupling said front to said rear wheels to enable a predetermined synchronous turning movement of said rear wheels in relation to said front wheels.

4,446,942

DEVICE FOR CONDUCTING AWAY THE EXHAUST GASES FROM INTERNAL COMBUSTION ENGINES

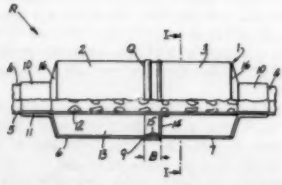
Jean Hardt, Benken, and Jakob Widrig, Winterthur, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 155,458, Jun. 2, 1980, Pat. No. 4,352,406. This application Jul. 6, 1982, Ser. No. 395,726

Claims priority, application Switzerland, Jun. 6, 1979, 5250/79

Int. Cl.³ F01N *1/02*

U.S. Cl. 181—249 **5 Claims**



1. A method for producing an aluminum exhaust system for use in conducting away gases from an internal combustion engine comprising the steps of deep drawing a pair of hollow bodies each having first and second substantially cylindrical-shaped portions connected together by a substantially conical-shaped portion, telescopically positioning the free end of said second substantially cylindrical-shaped portion of one of said pair of hollow bodies within the free end of said second substantially cylindrical-shaped portion of the other of said pair of hollow bodies, forming by electromagnetic forces a profiled shape on the free end of said second substantially cylindrical-shaped portions so as to join said pair of hollow bodies together by the profiled shapes.

4,446,943

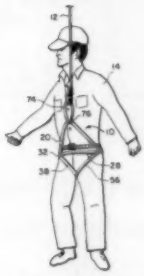
FIRE SERVICE HARNESS

Richard C. Murray, 402 Lincoln Ave., Staten Island, N.Y. 10306

Filed Mar. 3, 1983, Ser. No. 471,682

Int. Cl.³ A62B *1/16, 35/00*

U.S. Cl. 182—3 **6 Claims**



1. A rappel harness for lowering a person from a building comprising:

(a) a belly strap with left and right sides, having opposing ends with means for securing said ends together to encircle the person's abdomen;

(b) a waist strap having left and right ends and an intermediate portion adapted to be mounted on a rappel hook for supporting the harness;

(c) a pair of left and right leg straps each having a loop for securing a person's leg, each said leg strap having an end secured respectively to the left and right ends of the waist strap and an opposite end secured to the belly strap at a point spaced from the left and right ends of the waist strap wherein said waist strap is longer than the shortest distance between its left and right ends whereby the waist strap will have slack when not loaded and will assume a position vertically above the belly strap when loaded and will be virtually in the same vertical plane as the connection points between the waist strap and each leg strap thereby preventing toppling of the person being lowered.

4,446,944

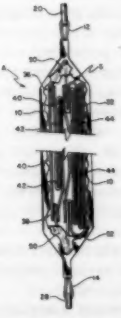
SHOCK ABSORBING DEVICE AND METHOD

William E. Forrest, and Frank R. Lupton, both of Denver, Colo., assignors to Forrest Mountaineering, Inc., Denver, Colo.

Filed Mar. 9, 1983, Ser. No. 473,577

Int. Cl.³ A62B *35/00*

U.S. Cl. 182—3 **14 Claims**



11. A shock absorber for gradually absorbing the kinetic energy of a falling body, whereby damage to the falling body,

anchor and equipment is minimized, said shock absorber comprising:

first, second and third energy absorbing webbing straps of successively increasing length and made of undrawn virgin nylon fibers and each having a first end and a second end;

a back-up strap having a longer reach than said longest third energy absorbing strap and made of substantially non-stretchable webbing, said back-up strap having an upper support loop formed adjacent one end as a portion of the strap folded over upon itself and secured together with said one end extending from said upper support loop and having a lower support loop formed adjacent the other end as a portion of the strap folded over upon itself and secured together with said other end extending from the said lower support loop, said first ends of said first and second energy absorbing straps being attached to opposite sides of said one end of said back-up strap and said second ends of said first and second energy absorbing straps being attached to corresponding opposite sides of said other end of said back-up strap and said first end of said third energy absorbing strap being connected to said reach of said back-up strap adjacent said upper support loop and said second end of said third energy absorbing strap being connected to said reach of said back-up strap adjacent said lower support loop;

ethylene glycol absorbed in each of said energy absorbing straps;

petroleum jelly coated on said energy absorbing straps to minimize evaporation of said ethylene glycol;

a water impervious cover enclosing said energy absorbing straps and said back-up strap and holding said second and third energy absorbing straps and said back-up strap in overlapping, folded condition approximately equal in length to said first energy absorbing strap, said cover being sewed at its ends to said upper and lower support loops by stitching so that upon stretching of said first energy absorbing strap said stitching will break; and

a plastic covering wrapped around said folded straps within said cover.

4,446,945

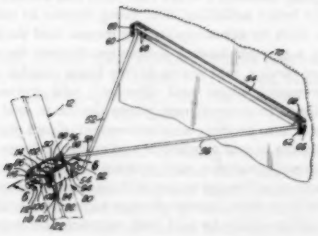
BRACE FOR SECURING A POLE TO SUPPORT SURFACE

Carl Anderson, 12 St. Stephens Pl., Staten Island, N.Y. 10306

Continuation-in-part of Ser. No. 255,631, Apr. 20, 1981, which is a continuation-in-part of Ser. No. 143,506, Apr. 24, 1980. This application Jan. 13, 1982, Ser. No. 339,091

Int. Cl.³ E04G 5/04

U.S. Cl. 182—229 **10 Claims**



1. A brace for securing a pole to a support surface, comprising:

a frame member for securement to the support surface;

a yoke assembly formed of a pair of U-shaped yoke members each having a respective pair of legs interconnected by a respective bight portion, one of said yoke members being coupled to said frame member and the other of said yoke members fitting around the pole;

swivel means comprising a pivot member coupling together said yoke members at their respective bight portions; said frame member comprising a pair of legs defining an X-shaped structure having one end wider than the other, and an integral connecting rod closing off the narrowed end of the structure to form a smaller and a larger triangle said connecting rod pivotally passing through the opposing legs of said one of said yoke members, whereby said yoke assembly and said frame member permit modification in the relative vertical orientation of the pole with respect to the support surface by providing for relative rotation about two mutually perpendicular horizontal axes, and wherein said swivel means lies along the center line of said X-shaped structure.

4,446,946

ELEVATOR SPEED INSTRUCTION GENERATING SYSTEM

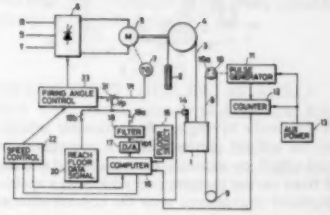
Ryuichi Kajiyama, and Masashi Yonemoto, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1981, Ser. No. 313,404

Claims priority, application Japan, Oct. 21, 1980, 55-147315

Int. Cl.³ B66B 1/18

U.S. Cl. 187—29 R **7 Claims**



1. In an elevator system including a cage movable in first and second directions between a plurality of floors at different positions along an elevator path, and moving means for moving said cage at a speed determined by a speed instruction data signal, said speed instruction data signal comprising an acceleration instruction data signal when operating in an accelerating mode and a deceleration instruction data signal when operating in a decelerating mode, a speed instruction signal generating system comprising:

a computer;

pulse generating means provided separately from said computer for generating a pulse whenever said cage travels a predetermined distance;

counter means connected to said pulse generating means for counting said pulses upwardly when said cage travels in said first direction and for counting said pulses downwardly when said cage travels in said second direction;

floor position storing means for storing at respective addresses data corresponding to the absolute positions of each of said plurality of floors with respect to a reference position;

speed instruction storing means provided in said electronic computer for storing at respective addresses a plurality of acceleration data corresponding to different desired speeds of said cage during operation in said acceleration mode and for storing at respective addresses a plurality of deceleration data corresponding to different desired speeds of said cage during operation in said decelerating mode;

comparison means in said computer for comparing the position of said cage indicated by the value in said counter with the absolute position of an appointed floor at which said cage is to be stopped to thereby detect a remaining distance value; and

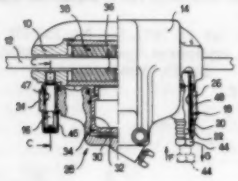
read out means in said computer for reading out increasing values of said acceleration data to said moving means as said acceleration instruction data signal during said accelerating mode and for reading a sequence of said deceleration data out of said speed instruction storing means as said deceleration instruction data signal to said moving means during said decelerating mode, the values of said sequence of decelerating data corresponding to said remaining distance value.

4,446,947

SLIDING CALIPER DISC BRAKE

Gérard Le Deit, Aulnay sous Bois, France, assignor to Societe Anonyme DBA, Paris, France

Continuation of Ser. No. 243,223, Mar. 12, 1981, abandoned. This application Sep. 29, 1982, Ser. No. 426,517
Claims priority, application France, Mar. 14, 1980, 80 05706
Int. Cl.³ F16D *65/09*
U.S. Cl. 188—73.34 **5 Claims**



1. A disc brake having a caliper member which is mounted slidably on a fixed carrier member, comprising two friction elements which are mounted in an anchored and slidable mode in said fixed carrier member and which are capable of coming into frictional engagement with the opposite faces of a rotary disc upon actuation of a brake actuating unit acting directly on one of the friction elements and acting on the other friction element by reaction by way of the sliding caliper member, at least one sliding axial pin which is fixedly secured at one end with respect to one of said members and which is received slidably in a corresponding bore formed in the other of said members, said pin co-operating with the corresponding bore by means of a sleeve of resilient material which is axially immobilized in said bore, characterized in that said pin includes a second end opposite said one end and said second end cooperates with said sleeve of resilient material to form unidirectional stop means which is capable of resiliently assuming an inoperative condition to permit the pin second end to be axially introduced into the sleeve upon assembly of the brake, and said unidirectional stop means assuming an operative condition to resiliently oppose withdrawal of said pin second end from said sleeve and said unidirectional stop means is axially disposed outside said other member bore in the operative condition.

4,446,948

DISC BRAKE CALIPER MOUNT

Wolfgang Melinat, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 29, 1982, Ser. No. 362,988
Int. Cl.³ F16D *55/224*
U.S. Cl. 188—73.45 **3 Claims**

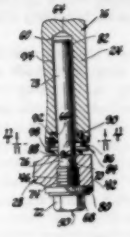
1. A sliding arrangement in a disc brake comprising:

a carrier formed with a blind bore having a closed end and an open end;

a caliper having a pin including a slide portion slidably received in said bore;

said pin extending through a support portion of said caliper and having in axial series order a head portion, a pin threaded portion, a pin pilot portion and said slide portion;

said caliper support portion having a threaded portion receiving said pin threaded portion in threaded relation and a pilot portion receiving said pin pilot portion in piloted engaging relation so that said pin is in respective axially and diametrically secure relationship with said caliper support portion;



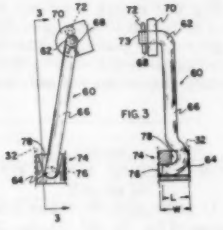
and a protective boot around a part of said pin and mounted on said carrier at said bore open end and on said pin adjacent said caliper support portion to protect said pin slide portion and said blind bore.

4,446,949

CONNECTING ROD AND PISTON DEVICE FOR A BRAKE SLACK ADJUSTER

James L. Weber, West Bloomfield, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 13, 1982, Ser. No. 339,037
Int. Cl.³ F16D *65/40*
U.S. Cl. 188—79.5 K **2 Claims**



1. An improved connecting rod and piston device for a brake slack adjuster of the type used to produce desired readjustment of a coupling between a brake cam shaft and a brake actuation lever, said brake actuation lever being caused to rotate about said cam shaft by actuation linkage means, said slack adjuster including a plunger having a chamber therein for receipt of said piston device, said piston device being capable of limited axial movement within said chamber, said connecting rod being utilized to connect said piston device to said actuation linkage means to produce axial movement of said piston device corresponding to said rotation of said actuation lever, whereby predetermined excessive said rotation of said actuation lever by said actuation linkage means will cause said piston device to move axially to relocate said plunger to produce said readjustment of said coupling by said slack adjuster, said improvement comprising:

said connecting rod being formed of steel rod material which is bent at each end thereof to be perpendicular to a longitudinally extending intermediate section between each said end;

a first of said ends of said connecting rod being received within a hole in said actuation linkage means;

said piston device including a radial bore therethrough which intersects an axially extending opening therein;

a second of said ends of said connecting rod and an adjacent portion of said intermediate section being respectively

received within said bore and said axially extending opening of said piston device; and

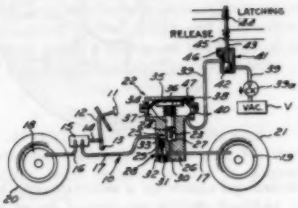
said second end having an overall length which is less than a width of said chamber and too great to allow its removal from said bore when said piston device is in said chamber.

4,446,950

BRAKE CONTROL APPARATUS

Stanley S. Wise, Boynton Beach, and Peter Maitland, Pompano Beach, both of Fla., assignors to Fail Safe Industries, Inc., Lantana, Fla.

Filed Dec. 3, 1981, Ser. No. 327,171
Int. Cl.³ B60K *41/20*
U.S. Cl. 192—3 TR **29 Claims**



1. In a brake control apparatus on a motor vehicle having an accelerator pedal, a brake pedal and fluid pressure-operated brakes which are applied by fluid pressure in a conduit responsive to depression of the brake pedal, said apparatus having:

valve means in said conduit for controlling the fluid pressure applied to the brakes;

electrical control means for closing said valve means to keep fluid pressure applied to the brakes after the brake pedal has been depressed;

and means for opening said valve means when said electrical control means is de-energized;

the improvement which comprises:

digital signal generator means operable to produce digital signals varying with the vehicle speed;

and means operatively connected to the output of said digital signal generator means for energizing said electrical control means to close said two-way valve means when

(a) the vehicle operator releases the accelerator pedal, and

(b) the vehicle speed decreases to within a predetermined speed range and thereafter drops below a preselected intermediate speed within said range.

4,446,951

VEHICLE FULL PARK ENGAGEMENT APPARATUS

George R. Morris, 5643 E. Albain Rd., Monroe, Mich. 48161

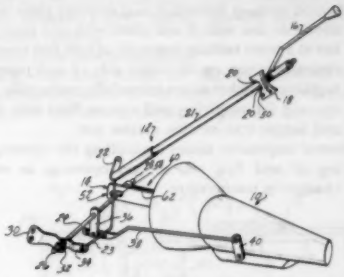
Filed Nov. 18, 1981, Ser. No. 322,650
Int. Cl.³ B60K *41/26*
U.S. Cl. 192—4 A **5 Claims**

1. In a vehicle transmission including a selector lever movable between a plurality of positions, each associated with a distinct vehicle movement state and a park position, a detent plate associated with the selector lever and having a plurality of detent positions, each associated with one of the vehicle movement states and the park position, a bell crank rod having first and second ends, a first mounting bracket fixedly secured to the vehicle and rotatably supporting the first end of the bell crank rod in a fixed position, a first linkage means connected between the selector lever and the bell crank rod for transmitting movement of the selector lever to rotation of the bell crank rod, a second linkage means connected between the bell crank rod and the transmission for transmitting rotation of the bell crank rod to the vehicle transmission for selecting one of the vehicle movement states and the park position, the improvement comprising:

a full park engagement apparatus including:

a second bracket secured to the vehicle for rotatably supporting a second end of the bell crank rod; and

means, associated with the second bracket, for allowing



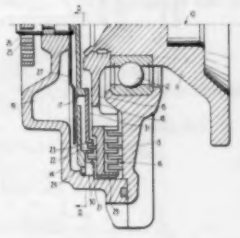
translation of the second end of the bell crank rod after the second linkage means has stationarily engaged the transmission park position to permit further travel of the selector lever such that the selector lever is fully urged into the park detent in the detent plate.

4,446,952

VISCOUS FLUID COUPLING ASSEMBLY

Hiroto Masai, Aichi, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 9, 1981, Ser. No. 319,760
Claims priority, application Japan, Nov. 10, 1980, 55-158634
Int. Cl.³ F16D *35/00, 43/25*
U.S. Cl. 192—58 B **8 Claims**



1. A viscous fluid coupling assembly comprising:

an input coupling member driven by an engine and having a rotating rotor;

an output coupling member rotatably mounted on said input coupling member;

a dividing plate connected to said output coupling member and interposed between said rotor and said output coupling member while dividing the inside of said output coupling member into a reservoir chamber for a viscous fluid and a working chamber having said rotor located therein;

first torque transmission surface means being formed between one side of said rotor and a corresponding side of said output coupling member for transmitting a torque by means of said viscous fluid between said one side of said rotor and said corresponding side of said output coupling member;

second torque transmission surface means being formed between the other side of said rotor and a corresponding side of said dividing plate for transmitting a torque by means of said viscous fluid between said other side of said rotor and said corresponding side of said dividing plate;

a first passageway adjacent the outer periphery of said dividing plate for permitting passage of said viscous fluid from said working chamber to said reservoir chamber;

a first opening being formed in said dividing plate for supplying said viscous fluid to said first and second torque transmission means;

a second opening formed in said dividing plate in communication on one side of said plate with said reservoir chamber at a point radially inwardly of said first opening and in communication on the other side of said plate with said working chamber at a point radially outwardly of said first opening for supplying said viscous fluid only to said second torque transmission means; and

thermal responsive means controlling the opening and closing of said first and second openings in response to changes in temperature.

4,446,953

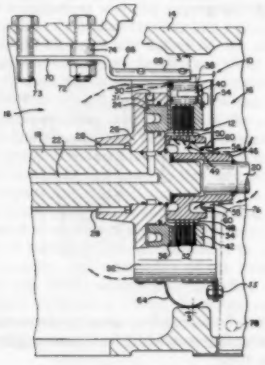
CLUTCH OIL SHIELD AND DIVERTER

Julian D. Voss, Naperville; Aldo Allori, Brookfield, and John A. Wilger, Chicago, all of Ill., assignors to International Harvester Co., Chicago, Ill.

Filed Nov. 17, 1981, Ser. No. 322,149

Int. Cl.³ F16D *13/72*

U.S. Cl. 192—70.12 **6 Claims**



1. A hydraulic fluid shield immersed in a fluid bath and comprising:

a peripheral wall with an open one end and coaxially encompassing a multiple disc clutch;

a shield cover rigidly attached to another end of said peripheral wall and blocking a fluid entry into said clutch;

said cover having a center opening defined by an annular baffle extending transversely to said cover;

a clutch hub having a portion thereof located within said center opening;

said clutch hub portion and said annular baffle forming a passage for the fluid entry into said clutch thereby improving a cooling effect of the fluid flowing through said clutch; and

whereby the hydraulic fluid diverted into said clutch through said passage is entrained into and ejected from said clutch due to the centrifugal force exerted thereon.

4,446,954

CENTRIFUGAL CLUTCH FOR POWER SAWS

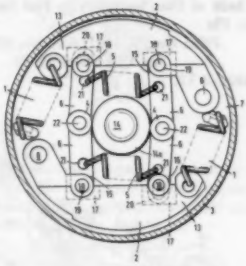
Hermann Weiss, Grossbottwar, Fed. Rep. of Germany, assignor to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Oct. 30, 1981, Ser. No. 316,569

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1980, 3041213

Int. Cl.³ F16D *43/24, 43/18;* B23D *57/02;* B27B *17/10*

U.S. Cl. 192—105 CD **18 Claims**



1. A centrifugal clutch for a motor-driven chain saw subjected to kickback during use thereof by an operator, the centrifugal clutch comprising:

a rotating carrier plate driven by the motor and defining an axis of rotation;

a drum arranged in surrounding relationship to said carrier plate and operatively connected to the saw chain for driving the same;

centrifugal means mounted on said plate for engaging said drum at a first predetermined rotational speed, said centrifugal means including: a pair of diametrically adjacent centrifugal weights pivotally mounted on said plate so as to be movable between a first and a second position, and, spring means for spring loading said centrifugal weights;

said weights being movable from said first position to said second position against the force of said spring means in response to said first rotational speed, said weights engaging said drum at said second position for holding the same with said plate thereby driving the saw chain, the holding force between said weights and said drum increasing with increasing rotational speed;

lever means connected between said weights and having return weight means mounted thereon responsive to a second predetermined rotational speed greater than said first rotational speed; and,

connection means for connecting said lever means to said weights to permit unimpeded movement of said weights relative to said lever means and to actively engage said weights to limit the magnitude of said holding force between said weights and said drum when said second predetermined rotational speed is reached thereby preventing the kickback condition.

4,446,955

CLUTCH DRIVEN PLATE ASSEMBLY WITH A FLOATING HUB

Thaddeus Lech, Jr., Sterling Heights, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

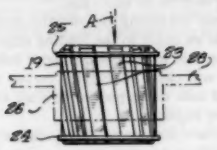
Continuation-in-part of Ser. No. 166,267, Jul. 3, 1980, abandoned. This application Dec. 4, 1980, Ser. No. 212,925

Int. Cl.³ F16D *3/12, 13/68*

U.S. Cl. 192—106.2 **50 Claims**

1. In a clutch driven plate assembly for an automotive vehicle clutch operatively connected to a transmission input shaft, wherein the assembly includes a radial hub flange operatively connected to friction facings adapted to be positioned between an engine flywheel and a clutch pressure plate, the improvement comprising a multipart hub assembly including an inner

hub operatively connected to the transmission input shaft and an outer hub, the radial hub flange being integral with one of said hubs, and a helical connection interposed between said



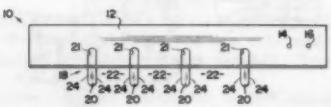
inner and outer hubs wherein one of said inner and outer hubs has axially elongated helical splines and said other hub has shorter splines to allow a substantial relative axial movement between the hubs upon rotation of said outer hub.

4,446,956

SINGLE COIN CARRIAGE BAR

Karl Knickerbocker, deceased, late of Venice, Fla. (by Lillie M. Knickerbocker, heir), assignor to Don G. Kaspar, Shiner, Tex., a part interest

Filed Feb. 16, 1982, Ser. No. 348,797
Int. Cl.³ G07F 5/08
U.S. Cl. 194—1 L **10 Claims**



1. A single coin carriage bar of the type designed for use with a coin controlled mechanism for a vending machine, said single coin carriage bar comprising a selector bar body having a substantially L-shaped elongated linear configuration of predetermined length, said selector bar body having a pivotal aperture formed on one end portion thereof to pivotally mount said selector bar body within the coin controlled mechanism, said selector bar body further including a crank arm aperture formed on said end portion adjacent said pivotal aperture disposed outwardly therefrom such that said selector bar body is disposed in operative movable engagement with the coin controlled mechanism; finger means integrally formed in said selector bar body, said finger means comprising a plurality of finger elements disposed to entend outwardly from the longitudinal axis of said selector bar body and disposed in predetermined spaced apart relative to one another, at least one of said finger elements positioned in interruptive relation to a path of travel of coins passing through said coin controlled mechanism, an aperture corresponding to each of said plurality of finger elements formed in the L-shaped intersection of said selector bar body whereby engagement of coins passing therethrough with certain ones of said finger elements causes vertical movement of said selector bar body and actuation of the coin controlled mechanism in response to individual coins engaging at least one of said finger elements.

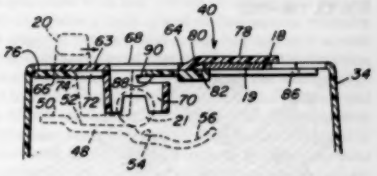
4,446,957

COIN OPERATED ARTICLE DISPENSING MECHANISM

Jerry L. Dohse, Alsip, and Peter A. Hess, Chicago, both of Ill., assignors to Damon Corporation, Needham Heights, Mass.

Filed Jan. 28, 1982, Ser. No. 343,427
Int. Cl.³ G07F 5/02
U.S. Cl. 194—54 **6 Claims**

1. In a coin operated article dispensing device comprising:
base means including article access means, and
reservoir means for holding a plurality of articles to be dispensed, mounted on said base means,
the improvement comprising a coin operated mechanism that comprises:
base plate means forming a portion of said base means, and
slide plate means slidably mounted on said base plate means, slidable between a first, locked, position and a second, dispensing, position
said slide plate means including:
article dispensing means for dispensing articles when said slide plate is moved from said first locked position to said second dispensing position



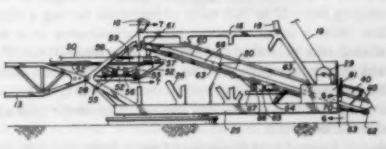
means defining an article aperture for passage of articles from said reservoir means to said article dispensing means,
a first coin slot portion partially defining a coin receiving slot, including a shoulder portion, and
actuator means for slidingly moving said slide plate,
said base plate means including:
a second coin slot portion partially defining said coin receiving slot, including a dog means flexibly mounted on said base plate means and arranged to abut said shoulder portion in the absence of a coin in said coin receiving slot and to be displaced from said abutting position by a coin inserted in said slot.

4,446,958

CROSS-PIT CONVEYOR

Thomas H. Dalrymple, Marion, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 16, 1981, Ser. No. 321,862
Int. Cl.³ B65G 47/18
U.S. Cl. 198—311 **9 Claims**



1. A cross-pit conveyor for transporting excavated soils from the working bench across the pit to the reclamation area in a strip mining operation, comprising:
a base suitable for positioning on the working bench;
a horizontally extending upper frame mounted on said base and swingable about said base in a generally horizontal plane;
a vertically inclinable long main conveyor pivotably connected at one end to the front end of said frame and extending therefrom across the pit to a discharge end;
means for raising and lowering the discharge end of said main conveyor to change the inclination of said main conveyor; and
a vertically inclinable auxiliary conveyor longitudinally aligned with said main conveyor and pivotally connected near one end to the back end of said upper frame and extending forwardly through said frame to a discharge

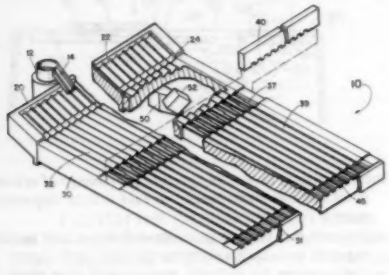
end cooperatively overlapping said connected one end of the main conveyor, said discharge end of the auxiliary conveyor resting for support on said main conveyor such that it will move up and down therewith as the inclination of said main conveyor changes to maintain a substantially constant drop distance for transferring excavated soils from said auxiliary conveyor onto said main conveyor.

4,446,959

MULTIPLE RAIL LINEAR FEED SYSTEM

Clifford E. Dunlap, Pasadena, Calif., assignor to North American Philips Corporation, New York, N.Y.

Filed Oct. 13, 1981, Ser. No. 310,673
Int. Cl.³ B65G *47/24*
U.S. Cl. 198—382 **7 Claims**



1. An improved multiple rail linear vibratory feeder system for orienting parts into multiple rows of single file, having means comprising:

means to dispense randomly oriented parts into each of said rails of said feed plate at a first end thereof;

means to vibrate said feed plate such that said parts move from a first end thereof to a second end thereof, whereby the movement of said parts along said rails effects a desired orientation of said parts at the end of their travel along said rail;

a linear feed plate;

a plurality of rails formed in one surface of said plate;

each of said rails having at least one side wall and a base; each of said rails having a sloping base from its first end to a point beyond a discriminator area, the angle of slope ranging from 5° to 30°; each of said rails having a sloping base from a point adjacent said discriminator area to its second end, said angle of slope ranges from 0° to 30°;

means positioned between the ends of said feeder plate to discriminate between properly oriented parts and misoriented parts, said means forming a discriminator area along each of said rails;

means to remove said misoriented parts from said rails in the direction of feed, such that only properly oriented parts arrive at said second end of said feeder plate;

said discriminator area including an upper discriminator and a lower discriminator,

said lower discriminator comprising:

an elongated hole cut into each of said rails such that one vertical sidewall and an adjacent portion of the angled base remain in tact, said remaining portion of said base track being sufficient to allow a properly oriented part to pass over it without falling into said hole;

said hole being of a size sufficient to permit a misoriented part to fall off said track and through said hole;

said upper discriminator comprising:

a bar secured to said feeder plate in said discriminator area above and transverse to said lower discriminator holes;

said bar having a plurality of projections, one for each rail, extending downwards toward said rails, each of said projections being dimensioned to permit a single part to pass under it along one of said rails;

a portion of the lower surface of each of said projections being angled so as to be parallel to the surface of the angled base of each of said rails;

said projections extending downward from said bar and positioned at an angle to the leading edge of said bar and directed over said lower discriminator holes such that said projections will cause parts lying on top of other parts in each of said rails to be pushed toward and through said discriminator holes;

wherein the lower surface angle of said projections ranges from 5° to 30°; and

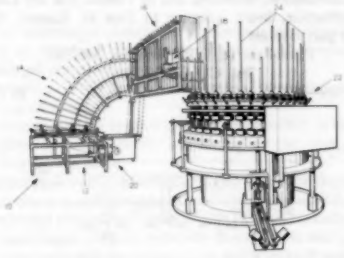
a terminal bar at the second end of said feeder plate.

4,446,960

TUBING LOADER

Otto Zauner, Vineland, and Fred Bender, Millville, both of N.J., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 9, 1981, Ser. No. 281,815
Int. Cl.³ B65G *47/24*
U.S. Cl. 198—408 **22 Claims**



1. An apparatus for receiving and reorienting elongate stock comprising, in combination,

means for receiving a plurality of pieces of elongate stock in a substantially horizontal orientation;

means associated with said receiving means for disposing such elongate stock substantially adjacent one another in a single thickness horizontal row; and

means for reorienting such stock from such substantially horizontal orientation to a substantially vertical orientation, said reorienting means including a pluarality of stock engaging lugs secured to at least a pair of means for driving said lugs through an arc whereby each elongate stock is engaged by at least a pair of said lugs and is reoriented generally about one end.

4,446,961

APPARATUS AND METHOD FOR UNSCRAMBLING AND SEPARATING ELONGATED ELEMENTS

Kenneth L. Klusmier, Worcester, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed Oct. 5, 1981, Ser. No. 308,381
Int. Cl.³ B65G *47/12*
U.S. Cl. 198—443 **5 Claims**

1. Apparatus for unscrambling and separating a plurality of elongated elements randomly deposited in a pile at a receiving station, comprising:

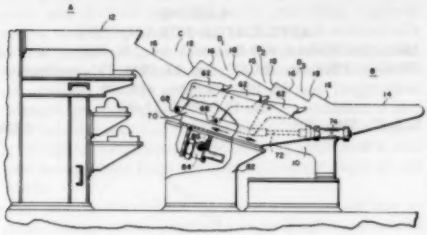
parallel stationary rack members extending from said receiving station to a discharge station, said rack members having upwardly facing notches aligned laterally to form a succession of element separating stations,

first transfer means for shifting batches of elongated elements from the pile at said receiving station into the first of said separating stations,

second transfer means movable cyclically relative to said

stationary rack members to shift elongated elements from one separating station to the next towards said discharge station;

third transfer means movable cyclically relative to said stationary rack members to shift elongated elements from one separating station to the next towards said receiving station, said third transfer means being arranged to bypass



at least selected elements supported exclusively at the bases of the laterally aligned notches forming each separating station; and

means for operating said second and third transfer means in alternating cycles in order to deliver individual elongated elements from the last of said separating stations to said discharge station.

4,446,962

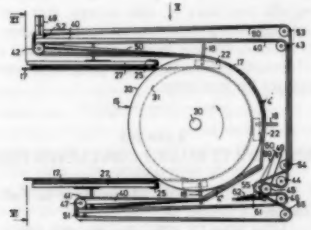
CONVEYING DEVICE WITH PUSHER FINGERS

Gisbert Burkhardt, Reichenau, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 868,336, Jan. 10, 1978, abandoned. This application Aug. 11, 1982, Ser. No. 407,071

Int. Cl.³ B65G *47/26*

U.S. Cl. 198—457 **19 Claims**



1. In a conveying device for rectangular substantially flat objects of varying dimensions comprising first and second horizontal conveyor sections each including a guide trough which defines a conveying path for the objects and supports a longitudinal edge of same, a direction changing conveyor section connecting said first and second sections together so that objects can be conveyed from said first to said second section, an orbiting pulling means, having a plurality of pusher fingers mounted on said pulling means, for moving said fingers along said guide troughs of said first and second conveyor sections so as to move objects along said conveying path, said pulling means being mounted on a plurality of drums which are mounted for rotation about respective vertical axes and with one of said drums being disposed in said direction changing conveyor section and having a first contact surface for said pulling means; the improvement wherein said direction changing conveyor section comprises: a second contact surface on said one of said drums, said second contact surface having a greater radius than that of said first contact surface and being disposed relative to said guide troughs so as to provide an object engaging surface in said direction changing conveyor section; an endless cover belt formed of an elastic material so as to be elastically yieldable with respect to its length; and means, including a plurality of rollers, for supporting and guiding said cover belt so that it normally encloses and contacts the portion of said second contact surface in said direction changing conveyor section and so that it extends along a portion of each of said guide troughs and coacts with same as an outer guide element for the objects in the transition regions between each of said first and second conveyor sections and said direction changing conveyor section to guide the objects from said guide trough of said first section into engagement with said portion of said second contact surface beneath said cover belt and from engagement with said portion of said second contact surface onto said guide trough of said second section, whereby the objects are held between said cover belt and said second contact surface and conveyed thereby through said direction changing conveyor section, and whereby, as the leading edge of an object is gripped between said second contact surface and the surface of said cover belt, the object is accelerated away from the associated said pusher finger, due to the difference in the circumferential speeds of the coacting gripping surfaces and of the pusher finger, in order to avoid undesired contact between the object and the pusher finger during travel through said direction changing conveyor section.

4,446,963

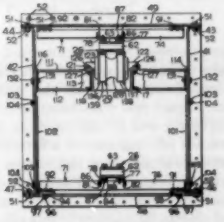
RETURN CHAIN ROLLER SUPPORT FOR EN MASSE CONVEYOR

Elmer J. Renner, Aurora, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 13, 1981, Ser. No. 321,317

Int. Cl.³ B65G *19/18*

U.S. Cl. 198—735 **5 Claims**



1. In an en masse conveyor apparatus having a longitudinally extending casing made up of sections of predetermined length and generally rectangular cross section releasably secured to one another in an end to end relationship, an endless conveyor chain with a lower working run and an upper return run disposed in the central vertical longitudinal plane of the casing and having pivotally interconnected links with laterally spaced side bars and transversely extending flights secured at their central portions to selected links of the chain, the combination comprising:

a roller for supporting the return run of said conveyor chain having a shell with laterally spaced radially outward facing cylindrical surfaces engageable, respectively, with said laterally spaced side bars of said chain and having a stationary shaft with mounting portions extending transversely beyond axially opposite ends of said roller shell,

one section of said casing presenting transversely spaced vertical side walls,

a support for said roller including

a pair of longitudinally spaced horizontal support beams extending transversely between said side walls,

a pair of transversely spaced horizontal mounting beams extending longitudinally between and secured to said

support beams, said mounting beams being disposed inwardly a substantial distance from said side walls, and detachable fastening means securing said ends of said shaft to the upper sides, respectively, of said mounting beams whereby the axis of said shaft is horizontal and transverse to said longitudinal central vertical plane and

releasable securing means fastening the laterally opposite ends of said support beams to said side walls, respectively, said support for said roller serving to reinforce said side walls and being removable therefrom upon release of said releasable securing means, said one section being removable from said casing without requiring prior removal of said support.

4,446,964

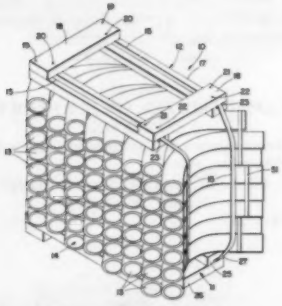
METHOD OF PACKAGING ELBOW-SHAPED MEMBERS AND PACKAGE MADE THEREBY

Thomas F. Moran, 540 Cobblestone, Aurora, Ohio 44202

Filed Sep. 12, 1980, Ser. No. 186,701

Int. Cl.³ B65D *85/46*

U.S. Cl. 206—321 **4 Claims**



1. A package of elbows which comprises:

a bottom frame comprising a pair of side frame members and a pair of end frame members, the side frame members being spaced apart and connected to each other at each end by one of the end frame members, the bottom frame having a recess for insertion of a fork lift;

a matrix of elbows arranged on the bottom frame in a plurality of vertical columns of elbows alternatively divided into first columns and second columns, each of the second columns of elbows having one fewer elbow in it than each of the first columns, each elbow in each of the second columns being situated vertically between two adjacent elbows in the adjacent first columns so that the elbows nest together to occupy a minimum amount of space, each of the elbows being an elongated member which has a circular cross-section in which has a curved central portion and two straight portions on each end of the curved central portion making an angle of more than 15° with respect to each other, the straight portions of each of the elbows being contiguous with adjacent elbows, all of the elbows being of the same size and facing the same direction, the side frame members of the bottom frame extending in a direction parallel to the plane bisecting the angle between the straight portions of the elbows of the matrix, the bottom frame being capable of supporting the entire matrix of elbows; and

a top frame located on the matrix of the elbows and comprising a pair of side frame members and a pair of end frame members, the side frame members extending in a direction parallel to the plane bisecting the angle between the straight portions of the elbows in the matrix of elbows, the side frame members being spaced apart and connected to each other at each end by one of the end frame members, the top frame being secured to the bottom frame by a pair of straps, each strap extending along one of the side members of the top frame and one of the side members of the bottom frame, the straps contacting the peripheral elbows in the matrix between the top and bottom frames, the top frame also capable of supporting the entire matrix of elbows when the package is inverted.

4,446,965

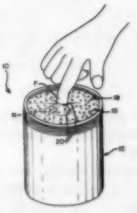
APPLICATOR FOR LIQUIDS

Alexandra Montiel, 639 Bushwick Ave., Brooklyn, N.Y. 11206

Division of Ser. No. 301,457, Sep. 14, 1981. This application Sep. 16, 1982, Ser. No. 419,056

Int. Cl.³ B65D *81/24*

U.S. Cl. 206—205 **4 Claims**



1. Applicator means for containing and applying a fingertip-treating liquid composition, which comprises:

a reclosable container; and

porous resilient absorbent means, shaped and dimensioned to fit unslippably within, and substantially to fill, said reclosable container, said absorbent means being a synthetic plastic foam sponge saturated with said liquid composition, said synthetic plastic foam sponge having at least one centrally disposed slit extending vertically into said sponge for facilitating entry of, and wet-sponge-contact with, a fingertip to be treated, said sponge also having a vertically extending slit positioned inwardly of, but following the periphery of, said sponge; said container and said sponge being dimensioned so that, when said container is open, all five fingertips of one hand may be inserted simultaneously into said peripheral vertically extending slit for treatment.

4,446,966

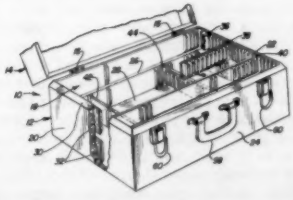
PRINTED CIRCUIT BOARD CONTAINER CARRYING CASE

Donald J. Moloney, Wilmette, Ill., assignor to Knickerbocker Case Company, Chicago, Ill.

Filed May 27, 1983, Ser. No. 498,938

Int. Cl.³ B65D *85/30, 5/48, 57/00;* **A47G** *19/08*

U.S. Cl. 206—334 **5 Claims**



1. A container for retaining printed circuit cards of various lengths and widths, comprising:

a base providing an open top box formed by opposed side walls spaced a transverse distance apart, opposed front and rear walls spaced a longitudinal distance apart and a bottom wall extending between all the side, front and rear

walls at a depth from the top margin thereof, the side, front and rear walls being lined internal of the base with panels providing regularly spaced apart slots, the panels extending substantially from the wall top margin to the bottom wall; and

a plurality of transverse and longitudinal planar dividers having end portions inserted in said wall carried panel slots, said dividers carrying panels providing regularly spaced apart slots and having heights equal substantially to one half of said depth, the transverse dividers having lengths equal to said transverse distance and the longitudinal dividers having lengths equal to said longitudinal distance, the transverse dividers being positioned in said base between said side walls at one of a lower and upper level and the longitudinal dividers being positioned in said base between said front and rear walls at the other of said levels;

so that said dividers selectively are inserted in said base to retain printed circuit cards of various lengths and widths in said slots.

4,446,967

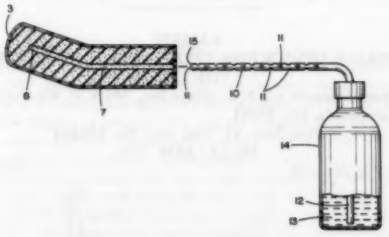
GERMICIDE SLEEVE FOR DENTAL AND MEDICAL INSTRUMENTS

Douglas R. Halkyard, 4300 Sandridge Rd., Morris, Ill. 60450

Filed May 7, 1982, Ser. No. 376,061

Int. Cl.³ B65D *83/10*

U.S. Cl. 206—368 **11 Claims**



1. A germicide enclosure to disinfect instruments used in the care and treatment of living beings, comprising an elongated enclosure having an open end, an outer wall of flexible sheet material extending from said open end to the opposite end of said elongated enclosure, said flexible sheet material comprising material having the characteristic of being able to readily conform to the shape of irregularly shaped instruments including those which have a bent shape wherein said flexible sheet material correspondingly bends to conform to such shape when such instrument is received in said sleeve, an inner wall of compressible absorbent material, an expandable diameter central bore bounded by said inner wall of compressible absorbent material and opening to said open end of said elongated enclosure, said expandable diameter central bore being expandable throughout its longitudinal dimension to conform at all points to the exterior configuration and dimension of a said instrument received therein and contractable to the original diameter of said central bore when said instrument is removed therefrom, said inner wall of compressible absorbent material being impregnable with a germicide solution, said inner wall of compressible absorbent material being compressible to permit expansion of said expandable diameter central bore sufficiently to receive instruments having a cross-sectional dimension substantially greater than that of a hypodermic needle and expandable back to its original thickness when not compressed to enable return of said expandable diameter bore to its original dimension, and sealing means to seal said open end to prevent leakage of said solution therethrough.

4,446,968

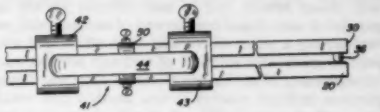
CARRY COVER ART OIL CANVAS

Mary E. Bremer, 11220 Willowbrook Dr., Potomac, Md. 20854

Filed Sep. 17, 1982, Ser. No. 419,342

Int. Cl.³ B65D *6/00, 23/10, 85/00;* **D06F** *3/08*

U.S. Cl. 206—451 **5 Claims**



1. An artists canvas carry cover for transporting a wet oil canvas comprising:

a first and second adjustable cover member in the form of an expandable rectangular framework, wherein each of said rectangular frameworks comprise four L-shaped members, and each leg of each L-shaped member is provided with means that will slidingly engage at least one leg of other L-shaped members to form the individual expandable rectangular frameworks, and wherein only one of said first and second adjustable cover members is provided on each of the four corners of the expandable rectangular framework with a single inwardly facing projection in the form of a small peg, that is adapted to frictionally engage the corners of the wet canvas, when the canvas is interposed between the first and second cover members, and

securing means for joining the said members together on either side of an artists canvas, wherein the securing means includes a combined clamp and handle device comprising a pair of generally C-shaped clamps connected by an elongated handle member, wherein each of said C-shaped clamps is dimensioned to engage at least one leg on the top each of said rectangular frameworks.

4,446,969

REINFORCED NESTABLE CONTAINERS

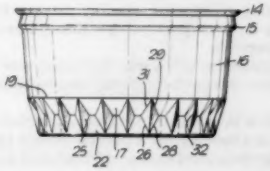
Frank S. Tyler, Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 398,039, Jul. 14, 1982, abandoned, which is a continuation of Ser. No. 190,782, Sep. 25, 1980, abandoned. This application Aug. 19, 1983, Ser. No. 524,625

Claims priority, application United Kingdom, Sep. 24, 1979, 7933000

Int. Cl.³ B65D *21/02, 1/46*

U.S. Cl. 206—519 **6 Claims**



1. A nestable container of integral construction which is formed from thin-walled plastic material and provides improved resistance to collapse under lidding forces, said container comprising a cup portion having an open upper end and a downwardly tapered sidewall, an intermediate portion having a sidewall which tapers downwardly and inwardly at a greater degree than said tapered sidewall of said cup portion, a pedestal portion having a closed bottom end and a sidewall angled differently from said sidewall of said intermediate portion, said cup portion including a rim at said open upper end

and a denesting ridge located below and having a greater diameter than the inner diameter of said rim for denesting like stacked empty containers, and stiffening means bridging said intermediate portion with said pedestal portion for providing collapse-resistance to the container, said stiffening means comprising a circumferentially disposed array of strengthening fillets of substantially diamond shape extending upwardly from said closed bottom end of said pedestal portion to a plane parallel to said closed bottom end of said pedestal portion and intersecting a point where said sidewall of said intermediate portion meets said sidewall of said cup portion, each of said strengthening fillets having a pair of adjoining triangular-like portions inclined relative to one another and which project outwardly from said sidewall of said intermediate portion and said sidewall of said pedestal portion.

4,446,970

DIABETIC SET

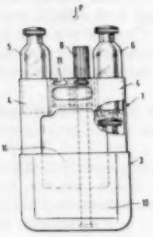
Günter Fürther, Oberfürbergerstrasse 26, 8510 Fürth, Fed. Rep. of Germany (D 8510)

Filed Jul. 21, 1981, Ser. No. 285,572

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1980, 3029226

Int. Cl.³ B65D *69/00*

U.S. Cl. 206—569 **1 Claim**



1. In a diabetic set including a housing for containing at least one insulin bottle, at least one injection syringe and, optionally, alcohol cloths or the like, the improvement comprising:

(a) the housing being pressure resistant and including a container and a removable cap engagable with the container;

(b) a plurality of slit elastic expandable sleeves carried by the container and extending into the container area over a portion of its length for releasably securing a plurality of insulin bottles therein and permitting free exposure of the entire heads of the bottles;

(c) a strip disposed between the sleeves;

(d) a plurality of holders carried by the strip for releasably securing a plurality of syringes through snapfit engagement therewith;

(e) the container including spaces disposed under the sleeves and coaxial therewith for storing reserve bottles of insulin; and

(f) the strip is substantially elongate and includes a concave curvature extending for a portion of its length to define space for the optical storage of alcohol cloths.

4,446,971

LIQUID CONTAINER WITH STRAW OPENING MEANS

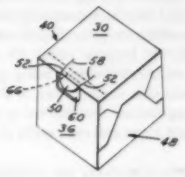
Daniel J. Wise, Farmington, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Nov. 10, 1982, Ser. No. 440,664

Int. Cl.³ B65D *5/54, 5/70*

U.S. Cl. 206—607 **3 Claims**

1. In a liquid carrying paperboard container coated overall with a thermoplastic material that serves as a barrier and becomes an adhesive when subjected to heat, and including a tubular body having four sides including first, second, third, fourth and fifth panels, wherein one side includes overlapped and sealed first and fifth panels, the improvement comprising means for forming a straw opening in said tubular body including tear strip means formed on the outer first panel along a pair of spaced apart lines beginning at the edge thereof adjacent the underlying fifth panel and extending laterally a distance just beyond the intermediate edge portion of the underlying panel, and including a tab formed as an extension of said tear strip,



with the inner ends of said pair of spaced apart lines defining a flexible hinge therebetween when said tear strip is peeled from said underlying panel, and a block score forming a depression on one of said fourth and fifth panels aligned with said tab and larger in area than the area of said tab such that said tab is sealed less tightly thereto under heat and pressure than other sealed surfaces due to the depth of said depression and, hence, readily releasable therefrom without disturbing any portion of the underlying portion of the panel bearing said depression.

4,446,972

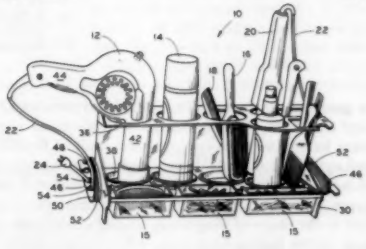
STORAGE DEVICE FOR A PORTABLE HAIR DRYER OR THE LIKE

Howard Sussman, c/o F. F. Adams Inc., 700 N.W. 8th Ave., Fort Lauderdale, Fla. 33311

Filed Mar. 12, 1982, Ser. No. 326,819

Int. Cl.³ A47F *7/00*

U.S. Cl. 211—13 **1 Claim**



1. A convenience device for storing an electrically operated portable hair dryer of the type having an elongated cylindrical front tube bounding a hot air exiting passage and having an attached electrical cord terminating in a plug for use in completing an electrical connection thereto, said convenience device comprising a body having a base, a laterally extending panel on said body in a spaced apart clearance position above said base, at least one cooperating pair of aligned openings located respectively in said base and said panel adjacent one side thereof adapted to receive in projected relation therein said hair dryer front tube for maintaining said hair dryer in a convenient vertical orientation preparatory to the use thereof, and a laterally extending hand grip on each of the opposite sides of the base of said body provided for convenient lifting and transportation of said device, each said hand grip having a first pair of opposite inwardly extending notches at the connection thereof with said base so as to be adapted to serve as a core for the convenient coiling thereabout of said hair dryer electri-

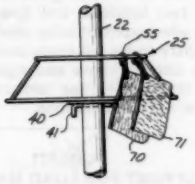
cal cord in the stored condition of said hair dryer, and additional plural spaced notches extending inwardly of the unattached remote edge of each said hand grip sized to engage in a friction fit therein said electrical cord, whereby after said electrical cord is coiled about said hand grip an appropriate one of said spaced notches is selected to receive said electrical cord at the connection thereof with said plug such that the friction fit thereof within said selected slot is effective to hold said electrical cord in its coiled storage condition about said hand grip.

4,446,973

DISPLAY SYSTEM FOR STIFF FLAT SAMPLES

Robert T. Fuller, 1351 Empire St., Anaheim, Calif. 92804, and Robert J. Sanders, 2200 E. Oskosh Cir., Anaheim, Calif. 92806

Filed Sep. 2, 1981, Ser. No. 298,910
Int. Cl.³ A47F *7/16*
U.S. Cl. 211—45 **10 Claims**



1. A display system comprising:

a plurality of samples made of sheet-like pieces of relatively stiff material such as carpeting, having dimensions of length, width and diagonal, and a corner; an upright spindle having a central axis; sample support structure supported by said spindle comprising a substantially circular support ring and a substantially circular spreader ring extending around said axis, said support ring being disposed above said spreader ring, and said spreader ring projecting radially beyond said support ring, said structure being supported by said spindle attachment means for each of said samples, each attachment means comprising a fastener engaged to said support ring and to said corner of said sample, being angularly movable relative to one of said support ring and sample, whereby each said sample is linked to and hangs freely with its diagonal extending generally downwardly, and being supported by said spreader ring so as to be supported by hanging against it, and being releasably attached to said support ring or said sample whereby a plurality of said samples can hang from said support ring in a shingled and spread-out array around and against said spreader ring, and can be removed from the array by detachment of said fastener.

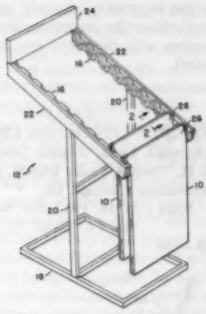
4,446,974

CARPET DISPLAY RACK

David A. Ott, LaGrange, Ga., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Apr. 19, 1982, Ser. No. 369,616
Int. Cl.³ A47F *7/16*
U.S. Cl. 211—45 **1 Claim**

1. A carpet sample display rack comprising: a base member, upstanding support means connected to said base member and sample support means connected to said upstanding support means at an angle to said base member, said sample support means including a pair of spaced sample support tracks spaced from one another, each of said support tracks having a plurality of upwardly opening slots on the inside surface thereof with the slots in one of said support tracks being substantially diametrically opposite to the slots in the other of said support tracks, each of said support tracks having a longitudinal axis and an axis perpendicular thereto, each of said slots having a front side and a rear side with the rear side being larger than the front side, said rear side of each slot being inclined in a direction away from the front side of said sample display rack while the front side of said slots is substantially parallel to the perpendicular axis of said support member, said front side of each of said slots having a projection thereon projecting



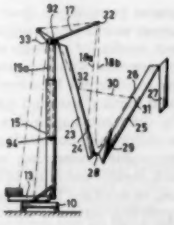
towards the rear side of said slot to maintain the top of a carpet sample placed in said slot in a bent back position to provide for ready observation of the carpet sample, said sample support tracks being a molded, plastic member with said slots being only in one face thereof where by the remaining position of said sample track supports prevents the sample support member for a sample supported in said slots from projecting outwardly from the sides of said carpet sample display rack.

4,446,975

ROTARY CRANE

Wilhelm König, Bungertweg 10, 5020 Frechen b. Köln, Fed. Rep. of Germany

Filed Mar. 1, 1983, Ser. No. 471,145
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1982, 3207443
Int. Cl.³ B66C *23/42, 23/02*
U.S. Cl. 212—188 **17 Claims**



1. Rotary crane comprising a carriage; a telescopic mast on said carriage having an inner portion movable upwardly from a remaining portion of the mast and having an upper end; a pivotable boom mounted at said end; said boom including at least one end hinged element connected to said end, a boom tip and at least one hinged intermediate member interconnected between said hinged element and said tip; a hinged support mounted at the end of said inner portion; a rope system connected to said intermediate hinged member and said hinged element and deflected at said hinged support and connected to said carriage for supporting and folding said boom such that the boom is folded to be in a transport position or expanded to be in an operation position, said end hinged element, said intermediate member and said tip each being of triangular

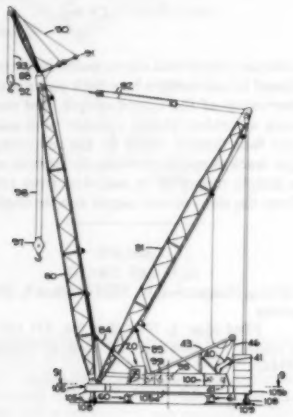
shape and including two lower chords spaced from each other and one upper chord, the chords in said end hinged element, in said member and in said tip being connected to each other respectively by rods; shackle means connecting the upper chord of the hinged element with the upper chord of the intermediate member such that they can pivot in a vertical plane with respect to each other, said shackle means being formed with an oblong opening extending in the direction of elongation of the boom when the latter is in its expanded position and including a pin insertable into said opening; and means for laterally interlocking the respective lower chord of the intermediate member with the respective lower chord of the end hinged element.

4,446,976

REVERSIBLE OUTRIGGER CRANE SUPPORT

Curtis E. Imerman, Cedar Rapids; David S. Langerud, Solon, and Brian H. Thomas, Cedar Rapids, all of Iowa, assignors to FMC Corporation, Chicago, Ill.

Filed Feb. 16, 1982, Ser. No. 349,100
Int. Cl.³ B66C *23/72*
U.S. Cl. 212—189 **5 Claims**



1. An apparatus including a basic crane with load lifting means on an upper works that is supported on a longitudinally extending lower works for rotation about a vertical axis, said basic crane components including power means for propelling the basic crane to different locations for rotating said upper works about said vertical axis and for selectively lifting loads of substantially different magnitudes between two locations; said apparatus additionally comprising means defining a pair of outriggers, removable connecting means, means defining a plurality of jack means, movable lifting elements on each of said jack means, an auxiliary frame, means defining rigid annular ground supporting surfaces, wheel means depending from said auxiliary frame, a gantry, a counterweight, power operated reeving, pendant means, and additional power means:

when handling a light load said apparatus comprising only said basic crane;

when handling an intermediate load which is too heavy to be lifted and transferred between two locations by said basic crane, said apparatus comprising;

said basic crane, said means defining a pair of outriggers, said removable connecting means connecting said outriggers to said lower works with the outriggers extending transversely of said lower works, said jack means secured to each end of each of said outriggers, said movable lifting elements being directed downwardly from said outriggers for supporting the intermediate load and at least a substantial portion of said basic crane;

when handling a heavy load which is too heavy to be lifted and transferred between two locations by said basic crane and said outriggers including said downwardly extending lifting elements, said apparatus comprising;

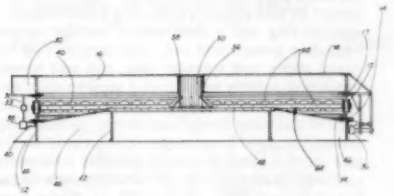
said basic crane, said outriggers with said lifting elements reversed and extending upwardly, said auxiliary frame encompassing said upper works and mounted for rotation with said upper works about said vertical axis and mounted for vertical movement relative to said upper works, said means defining a rigid annular ground supported surface being positioned below end portions of said auxiliary frame, said wheel means being in position to support said auxiliary frame for rotation about said vertical axis, said gantry and said boom being pivotally mounted on one end of said auxiliary frame, said counterweight being supported on the other end of said frame, said power operated reeving interconnecting the boom and gantry for varying the operating angle of said boom, said pendant means attaching said gantry to said auxiliary frame, said additional power means attaching said boom to the upper end of said gantry and cooperating with said power means for first lifting and carrying the heavy load between two locations, said upwardly directed lifting elements when extended being effective to engage and lift said auxiliary frame and component supported thereon a sufficient distance above said rigid annular surface for moving said basic crane and components supported thereon to a different location.

4,446,977

ROLLER SUPPORT FOR LOAD HANDLING DEVICES

James L. McClain, New Orleans, La., assignor to McDermott Incorporated, New Orleans, La.

Filed Mar. 31, 1981, Ser. No. 249,542
Int. Cl.³ B66C *23/84*
U.S. Cl. 212—247 **7 Claims**



1. In apparatus mounted on a barge for rotatably supporting a load handling device, the apparatus including a first frame structure rigidly secured to a bottom hull of the barge for supporting a plate means for supporting a load handling device thereon, and a vertically oriented center pin rigidly connected at its lower end to said first frame structure and the upper end of which is insertable in an aperture in the plate means to define a vertical axis for rotation of the plate means, the improvement in the apparatus comprises means including said plate means the diameter of which is greater than the first frame structure diameter and including a second frame structure secured to a deck of the barge and disposed outwardly of and rigidly secured to said first frame structure for effecting an increased diameter roller ring for reducing load stresses thereon, a lower roller pad rigidly mounted on an upper surface of said second frame structure and concentric with said center pin, an upper roller pad rigidly mounted on a lower surface of said plate means and concentric with said center pin, a roller ring including a pair of concentric ring members and a plurality of wheel means connected to and disposed between said ring members and engaging both said upper and lower roller pads for rotational movement of said plate means relative to said first and second frame structures, a swing gear fixed to said second

frame structure about the outer periphery thereof, a pinion gear for engaging said swing gear, and means rigidly connected to said plate means for rotating said pinion gear to thereby rotate said plate means relative to said first and second frame structures.

4,446,978

INSULATED CONTAINER

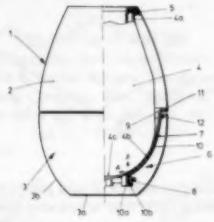
Manfred Arndt, Amstetten; Walter Breier, Geislingen; Hermann Riegert, Treffelhausen; Heinz Schmidt, Lonsee; Hermann Schwarz, Geislingen, and Helmut Warneke, Ostfildern, all of Fed. Rep. of Germany, assignors to Wurttemberische Metallwarenfabrik Aktiengesellschaft, Fed. Rep. of Germany

Filed May 5, 1982, Ser. No. 375,011

Claims priority, application Fed. Rep. of Germany, May 14, 1981, 3119245

Int. Cl.³ A47J *41/02*

U.S. Cl. 215—13 R **18 Claims**



1. An insulated container comprising a vacuum glass body surrounded in spaced relationship by a protective envelope consisting essentially of an upper portion and a lower portion in the shape of a bottom having an upwards projecting edge, and an adjustable tensioning means for producing a force biasing the glass body upwards into engagement with a seal at the upper rim of said protective envelope, characterized in that said tensioning means (6) comprises a base portion (9) supported by said upper envelope portion, support elements (10) engaging the periphery of said glass body (4) and at least one tensioning member (8) engaging said support elements (10) and adapted to be tensioned for biasing said glass body (4) upwards relative to said base portion and said support elements.

4,446,979

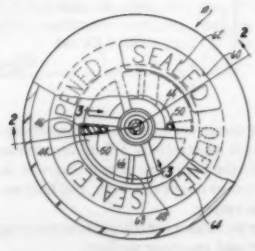
TAMPER INDICATING CLOSURE

Peter P. Gach, and Randall G. Bush, both of Evansville, Ind., assignors to Sunbeam Plastics Corporation, Evansville, Ind.

Continuation-in-part of Ser. No. 310,081, Oct. 9, 1981, abandoned. This application Feb. 14, 1983, Ser. No. 466,058

Int. Cl.³ B65D *55/02*; A61J *1/00*; B65D *85/56*

U.S. Cl. 215—203 **39 Claims**



1. A tamper indicating closure for containers having threaded necks forming an opening, comprising: a cup shaped cap member having internal threads to engage with threads on said neck of said container, a liner member supported by said cap member for rotation relative thereto, said liner member having an annular flange with a radially outwardly facing cylindrical friction surface for engagement with a complementary surface on the inner wall of said opening in said neck, said liner member forming adjoining first and second sectors, a window in said cap member alignable with said first sector indicating an initially closed condition or with said second sector indicating that said closure has been opened, cooperating drive means including a drive lug on one of said members engageable with driven surfaces on the other of said members, said driven surfaces including a first surface engaged by said lug when said window is in alignment with said first sector upon initial rotational movement of said cap and liner member as a unit in a closing direction in which said liner member is movable axially in a seated position relative to the neck of said container, a second surface engageable by said lug following movement of said cap member in an opening direction relative to said liner member during which said friction surface remains seated and said window moves into alignment with said second sector after which said cap and liner members are moveable as a unit to remove said friction surface from its said seated position, a third surface between said first and second surfaces, said second and third surfaces being engageable by said lug when said window is aligned with said second sector for rotation of said cap and liner member as a unit for all subsequent movements of said closure in a closing or opening direction, a cam surface associated with said third surface to deflect said lug axially to pass to a position between said second and third surfaces while said friction surface remains seated, the resistance to axial displacement of said lug being less than the resistance to rotation and axial movement of said friction surface from the seated position.

4,446,980

BOTTLE CORK EXTRACTOR

Robert Oliver, and Richard Branscombe, both of Modesto, Calif., assignors to E & J Gallo Winery, Modesto, Calif.

Filed May 17, 1982, Ser. No. 378,943

Int. Cl.³ B65D *41/04*

U.S. Cl. 215—276 **2 Claims**

1. A resealable bottle, including a tubular bottle neck having a cylindrical opening and having an inner surface and an outer finish surface extending from a lip, comprising:

helical threads extending from said lip along said outer finish surface;

a hollow extractor cap having a helically threaded cylindrical inner surface extending from a cap base to an annular protuberance within said cap, said annular protuberance having a diameter less than that of said bottle's opening, said cap having an apertured crown, said aperture having a diameter equal to that of said bottle's opening and being coaxial with said annular protuberance, the inner diameter of said cap being substantially equal to the outer diameter of said bottle neck, said cap threads being complementary to said outer finish surface threads wherein said cap is engagable with said neck such that said bottle opening, said annular protuberance, and said crown aperture are coaxial, and wherein said cap is disengageable from said neck; and

a compressed cork bottle stopper having a diameter greater than that of said bottle opening such that said stopper, when inserted through said bottle opening and advanced along said bottle inner surface into said bottle, seals said bottle; and wherein said cork is compressively gripped by said annular protuberance such that said cork is advanced into said bottle neck when said extractor cap is engaged with said bottle neck and such that said cork is withdrawn from said bottle neck when said extractor cap is disengaged from said bottle neck.

4,446,981

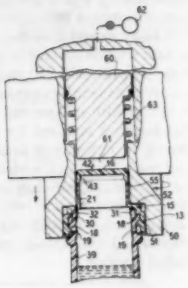
TAMPERING INDICATING BOTTLE CAP AND METHOD OF CLOSING A BOTTLE

Sidney M. Libit, 141 Lakeside Ter., Glencoe, Ill. 60022

Filed Oct. 6, 1982, Ser. No. 433,104

Int. Cl.³ B65D *41/28*

U.S. Cl. 215—354 **14 Claims**



1. A plastic closure cap for containers comprising a cup-shaped body member having an outer diameter axially extending skirt portion open at a first axial end thereof and a top portion closing a second axial end thereof opposite the first axial end, said top portion including a radially outer portion and an radially inner portion, the radially inner portion having an outer diameter less than the radially outer portion and projecting axially beyond the radially outer portion in a direction opposite the projection of the skirt and terminating in an end bottom wall, the axial projection of the radially inner portion from the radially outer portion to the end wall including a circumferential wall defining a hollow interior, the circumferential wall being yieldable whereby the top portion can be depressed from a first stable position spaced from the radially outer portion to a second stable position closer to the radially outer portion with the circumferential wall undergoing a U-shaped cross section convolution bend with the bight of the bend extending downwardly into the area bounded by the skirt during movement of the top closer to the radially outer portion, the bend being initially formed during such movement.

4,446,982

MULTI-PURPOSE BAKING UTENSIL

Kenneth J. Corse, R.D. #1, One Nina Dr., Kirkwood, N.Y. 13795

Filed Jan. 7, 1982, Ser. No. 337,866

Int. Cl.³ B65D *6/04, 6/24, 25/06*

U.S. Cl. 220—8 **3 Claims**

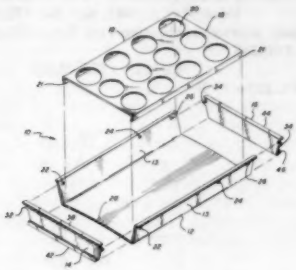
1. A baking utensil selectively adaptable to contain batter for producing baked goods of a plurality of sizes and shapes, said utensil comprising:

(a) a pan portion including a substantially rectangular bottom wall with two side walls extending integrally in the same direction from said bottom wall along opposite edges thereof, for equal distances to provide substantially parallel top edges of said side walls;

(b) each of said side walls having a plurality of openings therethrough at spaced locations to provide pairs of openings directly opposite one another along said side walls adjacent said top edges thereof;

(c) at least two end members each having substantially parallel top and bottom edges and opposite side edges each having an outwardly extending protrusion for releasable insertion in one of said opposite pairs of openings;

(d) said bottom wall being curved upwardly to provide a convex surface in the direction of said side edges, and being of resiliently flexible material to permit urging said convex surface toward a planar configuration; and



the relative sizes and shapes of said pan portion and said end members being such that when said protrusions on said side members are engaged in one of said opposite pairs of openings, said side edges are tightly engaged with said side walls and said bottom edge is tightly engaged with said bottom wall and flexes the latter to move said convex surface toward said planar configuration, whereby said end members form a batter-tight seal with said side and bottom walls.

4,446,983

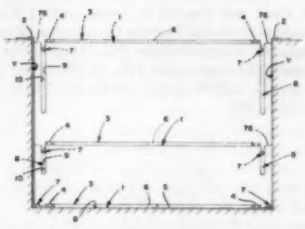
RESERVOIR COVER HAVING A DEFINED PERIPHERAL SUMP

Dennis H. Gerber, Los Gatos, Calif., assignor to Burke Industries, Inc., San Jose, Calif.

Filed Jan. 7, 1982, Ser. No. 337,677

Int. Cl.³ B65D *88/38*

U.S. Cl. 220—219 **10 Claims**



1. A flexible cover for a reservoir comprising:

a. said cover is substantially a fluid impervious sheet and is attached to the periphery of said reservoir and has an area dimensioned to cover the walls and bottom of said reservoir when empty;

b. said cover includes a central portion covering a substantial portion of said reservoir surface;

c. float means buoyantly carrying at least portions of substantially the entire border area of said central portion of said cover;

d. weight means affixed to said cover outwardly of said

border area of said central portion and outwardly of said float means around substantially said entire central portion so as to place substantially all of said central portion inwardly of said border area in tension in at least two different horizontal directions of sufficient magnitude to permit workmen to traverse all portions of said central portion of said horizontal cover for all working levels with said central horizontal portion remaining substantially planar in sustaining the weight of the workmen at all working levels of said reservoir;

e. said weight means and said float means are positioned so as to initiate and form a defined peripheral sump outwardly and immediately adjacent said entire border area of said central portion to receive surface water from said central portion; and

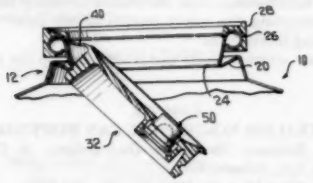
f. said peripheral sump having inner and outer sidewalls on which at least the upper portion of said inner sidewall between said float means and said weight means is in tension.

4,446,984

PUSH-IN CLOSURE

Donald J. Roth, Westport, Conn.; John Walter, Evergreen Park, Ill., and Charles S. Kubis, Weston, Conn., assignors to Continental Packaging Company, Inc., Stamford, Conn.

Filed May 23, 1983, Ser. No. 497,309
Int. Cl.³ B65D *17/32*
U.S. Cl. 220—268 **15 Claims**



1. A closure for a container pour opening, said closure comprising an outer annular retaining ring portion and an inner sealing plug portion, said inner and outer portions being integral and joined together along the periphery of said inner portion, said inner portion being defined partly by a hinge and the remainder by a rupturable weakening line, whereby the closure may be opened by pressing in said inner portion.

4,446,985

CLOSURE FOR CONTAINERS

Kenneth A. Dickson, 14 Chipping Rd., City Beach, Western Australia, Australia

PCT No. PCT/AU82/00074, 371 Date Jan. 4, 1983, 102(e) Date Jan. 4, 1983, PCT Pub. No. WO82/04026, PCT Pub. Date Nov. 25, 1982
PCT Filed May 11, 1982, Ser. No. 456,053
Claims priority, application Australia, May 11, 1981, PE8795
Int. Cl.³ B65D *41/32*
U.S. Cl. 220—269 **19 Claims**

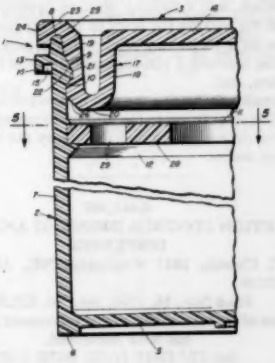
1. A closure for a container comprising: a wall for one end of a container, the wall having an upstanding peripheral flange, a continuous scoreline in the wall defining a tear portion only partially removable from the wall, the tear portion occupying first, second and third zones in the wall, the first zone being centrally located in the wall, the second zone being adjacent the edge of the wall and the third zone being displaced from both the first and second zones and also from the edge of the wall, the score line encompassing the first, second and third zones and being interupted to form an unscored section at the third zone, means for rupturing the score line at the first zone and enabling separation of the tear portion from the wall along the score line, the tear portion when removed from the wall along the score line being attached to the wall by the unscored section and being able to be folded into a position in which it lies within the confines of the wall and in the space defined between the wall and the outer edge of the upstanding flange.

4,446,986

FLUID TIGHT CONTAINER AND CLOSURE ASSEMBLY

Gary D. Bowen, Glens Falls, and James L. Bowen, Fort Ann, both of N.Y., assignors to Genpak Corporation, Glens Falls, N.Y.

Filed Aug. 2, 1982, Ser. No. 404,147
Int. Cl.³ B65D *39/00*
U.S. Cl. 220—307 **16 Claims**



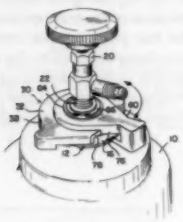
1. A plastic fluid tight container and closure assembly comprising a plastic container having a base, a sidewall extending upwardly from the base terminating in a rim defining an opening for the container, said sidewall defining on its inside a sloping abutment surface extending inwardly and downwardly from said rim and an annular notch terminating said abutment surface, and a plastic closure having a circular cover portion, a U-shaped annular rim joined to the periphery of said cover portion, said U-shaped rim having an inner wall and a radially spaced outer wall connected by a base to said inner wall, the outside of said outer wall defining an annular shoulder positioned above the level of the base, an abutment surface extending upwardly and outwardly from the shoulder and an angular annular flange joined to the upper end of the outer wall to form an annular groove, said closure when assembled on said container having its shoulder locked to the notch of said container, its abutment surface in liquid sealing contact with the abutment surface of said container and its annular groove fitting over the rim of said container.

4,446,987

VALVE ATTACHMENT FOR PRESSURIZED CONTAINERS

Kenneth R. White, 5144 E. 65th St., Indianapolis, Ind. 46220

Filed Feb. 3, 1981, Ser. No. 231,098
Int. Cl.³ B67B 7/24
U.S. Cl. 222—89 **13 Claims**



10. Mechanism for attaching a valve assembly to the neck of a container having a circular peripheral rim, comprising

an attachment body having means for supporting a valve assembly for the container,

lip means on said body for engaging the container rim at a plurality of points over an arc of less than 180° for positioning the body on the neck,

a locking arm on said body and carrying a lip movable with the arm and substantially in the plane of the body lip means between an assembly position for permitting a container rim to be moved into engagement with the body lip means, and a locking position opposite the body lip means for locking the body to the container,

said arm lip in its locking position being movable radially of the rim between a rim-engaging position and a retracted position, and

means resiliently biasing the arm lip toward its rim-engaging position so as to cause the arm lip to engage the rim with a force dependent on and limited by the strength of the biasing means.

4,446,988

PORTION CONTROL DRESSING AND FOOD DISPENSER

George C. Chronis, 1813 Washington NE., Albuquerque, N. Mex. 87110

Filed Nov. 16, 1981, Ser. No. 321,595
The portion of the term of this patent subsequent to Jun. 1, 1999, has been disclaimed.
Int. Cl.³ G01F 11/02; B67D 5/46
U.S. Cl. 222—63 **12 Claims**

1. A portion control and food dispenser device comrpising:

a chassis having a dispensing end, a butt end, a bottom, a top, and two sides; said chassis having a valve chamber, and said chassis having a piston chamber, and said chassis having a feed port connecting the valve chamber and the piston chamber, and wherein the dispensing end of the chassis is machined to accept a sliding dispensing door; and

a piston which slideably operates in the piston chamber; and

a slide valve which slideably operates in the valve chamber, and which is retained in the valve chamber by a lip formed near the top of the valve chamber; and

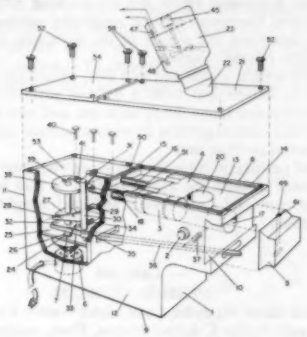
a sliding dispensing door which slideably mates with the dispensing end of the chassis; and

an electric motor contained within and mounted in the chassis, said electric motor having a drive shaft; and

a divider wall through which the drive shaft protrudes, said divider wall being within the chassis and said divider wall providing a moisture seal for the electric motor; and

a means for converting the rotary motion of the drive shaft into actuating motions to sequentially operate the slide valve, dispensing door, and piston; and

an electric circuit for starting, driving, and operating the invention, said electric circuit being capable of having an automatic shut off, and having the automatic shut off selectable; and



a flat top plate having a supply port which mates with the top of the chassis covering the valve chamber and a deck cover which mates with the chassis covering the means for converting the rotary motion of the drive shaft to actuating motion; and

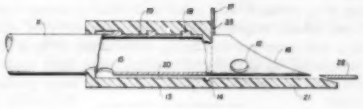
a container which sealably mates with the top flat plate.

4,446,989

GASKETLESS NO-DRIP OIL CAN DISPENSER

Wyley W. Brannen, Statesboro, Ga., assignor to Callaway Brothers, Inc., Atlanta, Ga.

Filed Mar. 26, 1982, Ser. No. 362,150
Int. Cl.³ B65B 7/24
U.S. Cl. 222—81 **4 Claims**



1. A piercing cutter-dispenser for entering and forming a dispensing aperture in the flat closure end of a generally cylindrical sealed can container for liquid, such as oil, and conveying the liquid from the container, with structure for preventing leaking or dripping about the dispensing aperture, comprising in combination,

a generally tubular metallic dispensing spout member having a piercing cutter blade on one end and a surface retention structure spaced along the tubular member from the cutter end adapted to retain thereon in registration a surrounding member,

a plastic liquid reservoir member generally cylindrical in shape of predetermined length having a flat end surface portion with an arcuate guide lip extending therefrom in one direction along and beyond the cutter blade as an extension of the cylinder to form a container engaging cylindrical arcuate surface, and with a detent structure adapted to mate with the retention structure on the spout member, said reservoir member fitting over said spout member in mating fixed position with the spout member holding said guide lip parallel to and spaced from the cutter end to position it for forming the dispensing aperture and to support and hold the dispenser frictionally on said can in stable position after forming said dispensing

aperture by resiliency between the plastic lip and cutter blade, with the cylindrical end surface portion of the plastic reservoir member adapted to fit flush against the flat closure end of the can,

the reservoir construction providing between its inner cylindrical circumference and the outer circumference of the spout member a spacing forming a reservoir for receiving liquid, and having a tightened collar about the end remote from the cutter blade and the can to retain any liquid within the reservoir established between the spout member and reservoir member,

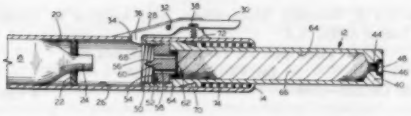
the spout member near the tightened collar having an aperture therethrough adjacent said collar but inside the reservoir to pass liquid in the reservoir into the spout, whereby the plastic member engages the flat closure end of the can to retard seepage of liquid from the can out around the reservoir member and retains any oil seepage from the can out around the cutter end of the spout member within the reservoir and provides a flow path for liquid out through the spout aperture as the liquid is dispensed with said flow path providing a suction effect to withdraw any liquid adjacent the spout cutter end on the can surface, thereby producing a drip-free dispenser without gasket structure between the dispenser and the can.

4,446,990

SELF-DEFENSE SPRAY DEVICE

David J. Stevenson, 36 Sandpiper Rd., Enfield, Conn. 06082, and Robert E. Domian, Somers, Conn., assignors to David J. Stevenson, Enfield, Conn.

Filed Apr. 3, 1982, Ser. No. 373,712
Int. Cl.³ B67B *7/28*
U.S. Cl. 222—82 **22 Claims**



1. In a device for spraying an incapacitating substance, the combination comprising: a body including two parts that are telescopically interengaged for sliding movement between relatively extended and retracted positions, one of said parts having a spray nozzle adjacent its outer end and puncturing means adjacent its inner end with an incapacitating substance containment chamber defined therebetween, the other of said parts defining a chamber for holding a gas cartridge in an inwardly directed position for rupture by said puncturing means in said retracted position of said parts; means for disengageably retaining said parts in said extended position; and biasing means for forcing said parts toward said retracted position, whereby upon release of said retaining means said puncturing means of said one part can explosively dischage a gas cartridge held in said other part, the expanding gas thereby released from the cartridge in turn ejecting the incapacitating substance from said containment chamber through said nozzle.

4,446,991

SELF-CONTAINED FLUID DISPENSER

Kenneth W. Thompson, Box 1455, Bartlesville, Okla. 74003

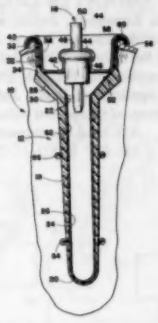
Continuation-in-part of Ser. No. 39,947, May 16, 1979, Pat. No. 4,324,350. This application Sep. 8, 1981, Ser. No. 299,997
Int. Cl.³ B67D *5/06, 11/00*
U.S. Cl. 222—94 **15 Claims**

1. A self-contained fluid dispensing apparatus comprising

an elongated tubular expandable unit of molded elastomeric material closed at a bottom end thereof and open at the opposite end;

an integral widened neck portion at the open end having an enlarged internal and external diameter and being integrally formed of thickened elastomeric material to resist stretching thereat;

an extension of elastomeric material beyond said thickened and enlarged diameters neck portion and integral with the neck portion;



a valve support plate means disposed across the neck portion; and

a fluid dispenser valve inserted through and sealed to the valve support plate means, said valve support plate means being sealed to the neck portion extension for closing the open end of the expandable unit.

4,446,992

FIXED QUANTITY FEED APPARATUS

Tomosaburo Suzuki, and Toshiki Kato, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daisei Kikai, Tokyo, Japan

Filed Feb. 19, 1980, Ser. No. 122,825
Claims priority, application Japan, Feb. 19, 1979, 54-20072[U]
Int. Cl.³ B65G *11/20*
U.S. Cl. 222—196 **1 Claim**

1. A fixed quantity feed apparatus for agricultural products, comprising:

an upstanding feed chute having a plurality of sides, opened at top and bottom ends thereof, said sides of said feed chute being fixed to one another and gently tapering to provide a larger cross sectional area at said bottom end than at said top end;

means for vibrating said entire feed chute;

a conveyor for feeding articles to the top end opening of said feed chute to form a column of articles in the feed chute; and

a fixed quantity dividing device for dividing the column of the articles of said feed chute to a given length for discharge from the bottom end opening, whereby a more uniform density of said articles along the length of said feed chute is achieved,

said fixed quantity dividing device comprising at least a first and second pin member; means for alternately inserting said first and second pin members into said feed chute and drawing said first and second pin members from said feed

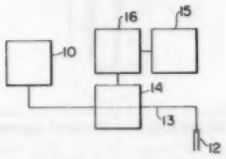
chute; and means for shifting said first and second pin members along the direction of feeding of the articles.

4,446,993

APPARATUS FOR DISPENSING A PRESELECTED AMOUNT OF LIQUID

Sadao Tokorozawa, Kanagawa, Japan, assignor to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 926,057, Jul. 19, 1978, Pat. No. 4,413,751. This application Feb. 24, 1982, Ser. No. 351,682
Claims priority, application Japan, Jul. 19, 1977, 52-86191
The portion of the term of this patent subsequent to Nov. 8, 2000, has been disclaimed.
Int. Cl.³ B65D *37/00*
U.S. Cl. 222—214 **12 Claims**



1. Apparatus for dispensing a preselected amount of a liquid drop-by-drop comprising; a reservoir, a peristaltic pump, an elastic tube coupling said reservoir to a discharge pipe, said liquid being pumped intermittently to said discharge pipe by the successive peristaltically squeezing and releasing of said elastic tube carrying said liquid and connected to said discharge pipe, said discharge pipe having a discharge port with a face, said face being perpendicular to the longitudinal axis of said discharge pipe, the outer diameter of said discharge pipe at said discharge port being than or equal to twice the inner diameter of said discharge pipe at said discharge port, means to regulate said pump whereby said preselected amount of said liquid is dispensed in a drop-by-drop fashion from said discharge port satisfying the following conditions:

(1) $V=Q\times M\times C$
(2) 50 mg $\geqq Q$
(3) 0.5 seconds $\leqq M$
(4) 3/seconds $\geqq C$
(5) $1.5\leqq M\times C$

wherein:

V is the weight of the produced liquid drop,
Q is the amount of liquid pumped per each pump,
M is the time interval between successive drops, and
C is the cycle of the pump.

4,446,994

CONTAINER WITH FLEXIBLE POURING SPOUT AND SEALING CLOSURE

Wallace E. Smith, 61 Meadow Brook Cir., Sudbury, Mass. 01776

Filed Aug. 26, 1982, Ser. No. 411,898
Int. Cl.³ B65D *47/10*
U.S. Cl. 222—475 **15 Claims**

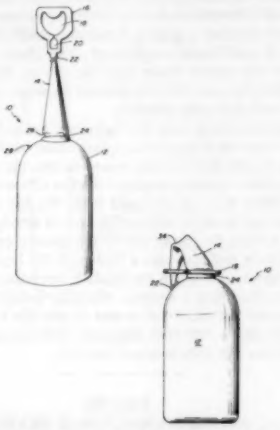
1. A container for dispensing a material from the container, which container comprises in combination:

(a) a body element to contain material to be dispensed from the container;

(b) a nozzle means secured to the body element, which nozzle means comprises an elongated, collapsible nozzle having a discharge outlet at the one end to dispense material from the body element and the other base end thereof secured to the body element;

(c) a sealing means on the exterior of the body element, to provide a seal with the open discharge outlet of the elongated nozzle element; and

(d) retaining means having a one end and another end, the one end having a first open area which fits in a snug securing manner about the base end of the nozzle and the other end of the retaining means which retains the nozzle in a collapsed



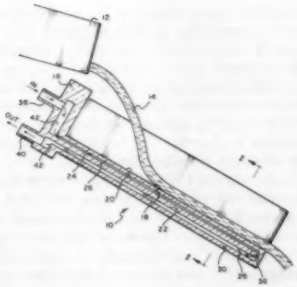
sealing position along a line of collapse in the nozzle and which places the open discharge outlet of the nozzle in a position to form a sealing relationship with the sealing means.

4,446,995

ULTRAHIGH VELOCITY WATER-COOLED COPPER TROUGH

Patrick J. Wooding, Moorestown, N.J., assignor to Wooding, Indian Mills, N.J.

Filed Oct. 13, 1981, Ser. No. 311,045
Int. Cl.³ B22D *41/08*
U.S. Cl. 222—590 **5 Claims**



1. A trough for delivering molten material flowing from a furnace comprising:

an elongated upper member having an upper surface for supporting said material and an elongated lower surface;

a coolant guide having a shape complementary to said upper member and being closely spaced from the lower surface thereof defining a highly restrictive narrow flow passage which extends substantially the entire length of said lower surface; and

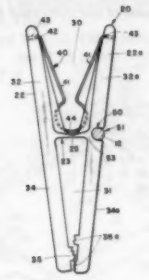
liquid coolant supply means in communication with said passage for supplying coolant thereto whereby the velocity of the coolant will be accelerated to an ultrahigh velocity across and against the lower surface of said member as it passes through the passage to thereby sweep away steam generated upon said lower surface.

4,446,996

MEANS OF SECURING GARMENT CLAMPS TO HANGER

Judd F. Garrison, Grand Rapids, Mich., assignor to John Thomas Batts, Inc., Zeeland, Mich.

Filed Sep. 3, 1981, Ser. No. 299,042
Int. Cl.³ A47J 51/14
U.S. Cl. 223—96 **2 Claims**



1. A garment hanger comprising a body consisting of a single cylindrical rod extending lengthwise of said hanger and a clamp depending therefrom, said claim being H-shaped and having a pair of legs and integral hinge means intermediate the ends of said legs joining said legs for pivotal movement with respect to each other; spring means acting at one end of said legs for forcing the other ends thereof together as clamping jaws, said clamp characterized in that a channel extends laterally of one of said legs; said channel having an opening extending through the outer surface of said one of said legs oppositely from and aligned with said hinge means; said channel being of a size and shape to snugly receive said single cylindrical rod therethrough and yet provide for relative movement lengthwise and in radial orientation between said clamp and said rod for adjusting the position of said clamp relative to said rod; said opening through said surface being more narrow than said channel for preventing said rod from passing therethrough; said channel being of a size and shape that the cross section of said one of said legs is substantially decreased and the flexibility of said one of said legs adjacent said channel is substantially increased, said rod being of a non-compressible material and providing support to said one of said legs against bending about said channel when the jaw end of said one of said legs is seated against a garment under the bias of said spring whereby the pressure with which said walls of said channel grip said rod is substantially increased due to the flexibility of said one of said legs adjacent said channel and the pressure of said spring against a garment clamped between said legs, the increase in the pressure with which said walls of said channel grip said rod thereby stabilizing the position of said clamp relative to said rod when a garment is placed on said hanger.

4,446,997

CONVERTIBLE CAMERA-SUPPORTING BELT DEVICE

Elliot Himberg, 4 Meadow La., Norwich, Conn. 06360

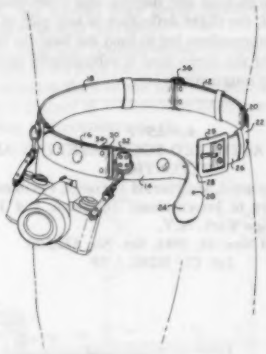
Filed Jan. 26, 1983, Ser. No. 461,275
Int. Cl.³ A45F 5/00
U.S. Cl. 224—151 **17 Claims**

1. A convertible multi-function camera-supporting belt for alternate, exclusive utilization solely as either a belt worn about the waist, or a strap worn about the neck or over the shoulder, comprising:

a belt strap having first and second sets of interconnecting ends adapted to be connectable to form an encircling belt, said strap being of sufficient length to be worn around the waist of a human, with no portion or apendage thereof simultaneously engaging the back of the user both above and below the shoulders of the user,

buckle means for adjustably securing said first set of ends together to form said waist encircling belt,

the ends of said second set being remote from the ends of said first set by a distance sufficient to place said second set adjacent one hip of the user when the belt is worn



about the waist, said second set being adapted to be disconnectable to form a shoulder strap and alternatively to form a neck sling

means for releasably connecting the ends of said second set together, and

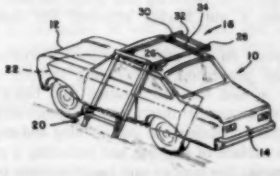
means for supportively hanging a camera from said belt strap adjacent the ends of said second set.

4,446,998

SUPPORT ASSEMBLY FOR A VEHICLE

Alistair G. Taig, 19032 Summers Dr., South Bend, Ind. 46637

Filed Dec. 7, 1981, Ser. No. 327,749
Int. Cl.³ B60R 9/04
U.S. Cl. 224—329 **3 Claims**



1. A support assembly for a vehicle having a roof extending over the top of the vehicle, the support assembly including at least one strip being formed from a flat piece of material, said one strip being engageable with the roof and connecting means engageable with the one strip, the support assembly being coupled to the vehicle and cooperating with the connecting means for the purpose of carrying cargo outside of the vehicle above the roof, characterized by said one strip including a pair of end legs engageable with said connecting means to form an invariant spacing between said pair of end legs and an intermediate leg extending integrally from said pair of end legs, said intermediate leg contacting the roof over substantially its entire length, said pair of end legs being bent in a normal direction relative to said intermediate leg to substantially define a V with said intermediate leg to dispose said connecting means in spaced relation to the roof, said pair of end legs also being bent in a lateral direction relative to said intermediate leg to impart an angular orientation (B) to said intermediate leg

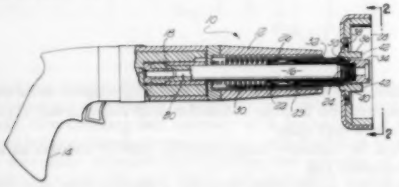
such that said intermediate leg substantially matches a contour for the roof, said pair of end legs cooperating with said intermediate leg to transmit a portion of the cargo load thereto in a direction substantially normal to the roof while at the same time transmitting another portion of the cargo load thereto in a direction substantially parallel to the roof, and said pair of end legs are relatively flexible to slightly deflect under the weight of the cargo load and dispose said connecting means closer to the roof, the slight deflection of said pair of end legs stretching said intermediate leg to load the latter in tension so that the weight of the cargo load is substantially spread over the length of said intermediate leg.

4,446,999

POWDER ACTUATED TOOL SAFETY GUARD RETENTION

John Benson, Sherwood, and Harold L. Hanel, Portland, both of Oreg., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 18, 1981, Ser. No. 322,590
Int. Cl.³ B25C *1/18*
U.S. Cl. 227—11 **1 Claim**



1. A tool for explosively driving an elongated fastener into a work surface comprising:

a housing having a barrel mounted therein, said barrel having a threaded forward end;

a safety guard for said barrel having an opening through which said forward end extends, said guard being slidable between forward and rear positions on said barrel;

means biasing said guard into said forward position;

retaining means threadedly engaged with said forward end of said barrel for retaining said guard on said barrel and comprising a nut having opposed flat side surfaces thereon;

blocking means on said guard cooperating with said retaining means preventing unthreading thereof when said guard is in said forward position said blocking means comprising an annular insert member removably mounted to said guard concentric to said opening and engaging the inwardly surface of said nut and including a pair of forwardly projecting lugs on said insert member on opposite sides of said nut each having an inner flat surface positioned in juxtaposition to a corresponding one of said side surfaces; and

said blocking means being released from said retaining means when said guard is retracted to said rear position thereby allowing unthreading of said retaining means from said barrel.

4,447,000

TURNOVER MECHANISM

Clifford H. Gage, Fort Edward, N.Y., assignor to Annette Kowalczyk, Staten Island, N.Y.

Filed Nov. 2, 1981, Ser. No. 317,239
Int. Cl.³ B27F *7/02*
U.S. Cl. 227—49 **13 Claims**

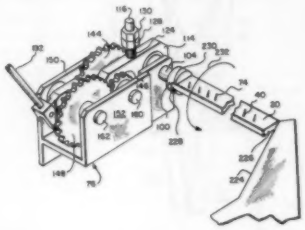
1. A turnover mechanism to turn over elongated strips for use in an automatic strip nailing machine of the type comprising a reciprocating ram to drive the nails into each strip in sequential operation and a conveyor to transport the strips to the mechanism, comprising the combination of

arm means connected to the ram for reciprocation to provide a linear, reciprocating power input upon each reciprocation of the ram;

ratchet means rotated by the arm means to convert the linear power input into uni-directional, rotary output,

the ratchet means being rotated through a first arc of rotation upon each reciprocation of the arm means;

a strip turner positioned above the conveyor to engage a first



end of each strip as the strip is transported by the conveyor; gear means rotated by the rotary output to rotate the strip turner,

the gear means being adapted to rotate the turner through a second arc of rotation that is greater than the first arc of rotation,

the strip turner being provided with means to engage the first end portion of each strip to turn over the strip as the turner is rotated;

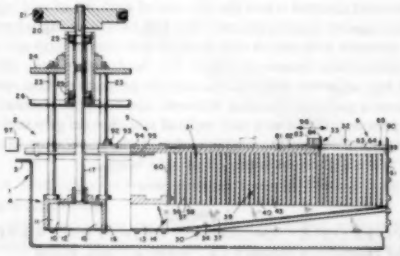
whereby the strip turner engages and turns over each strip in turn after the nails are driven by the ram.

4,447,001

ADJUSTABLY DIMENSIONED UNIFORMLY DISTRIBUTED SOLDER WAVE APPARATUS

Melvin K. Allen; Ronald J. Berri, both of Los Angeles, and Douglas N. Winther, Garden Grove, all of Calif., assignors to Banner/Technical Devices Company, Inc., Culver City, Calif.

Filed Dec. 11, 1980, Ser. No. 215,181
Int. Cl.³ B23K *3/06*
U.S. Cl. 228—37 **40 Claims**



1. A variable width solder wave generating apparatus, comprising means for producing a solder wave, including means for maintaining substantially uniform at least one of the height and contour of such solder wave substantially independently of the width thereof, and means for adjustably controlling the width of such solder wave, said means for producing comprising plural flow chamber means for directing vertically upward discrete solder streams to form such solder wave, and said means for adjustably controlling comprising valve means cooperative with said flow chamber means for blocking flow from selected ones of said flow chamber means, each of said

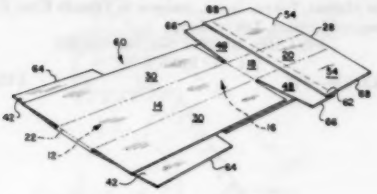
flow chamber means having a top wall and said valve means comprising means for engaging said top wall of selected flow chamber means substantially to block flow of solder from the respective flow chamber means.

4,447,002

CENTER SPECIAL SLOTTED CONTAINERS HAVING SELF-SQUARING JOINTS

Oscar J. Kistner, Cincinnati, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 2, 1981, Ser. No. 317,103
Int. Cl.³ B65D *5/02, 5/36*
U.S. Cl. 229—37 R **19 Claims**



1. In an intermediate folded blank for a center special slotted container of the type having a full end panel, a first side panel overlying said full end panel and foldably joined thereto along one side thereof at a score line, said first side panel of a length greater than that of said full end panel, a second side panel coplanar with said full end panel and joined thereto along a score line opposite said score line joining said full end panel to said first side panel, said second side panel having a length equal to that of said first side panel, a first full end flap joined to said full end panel along a score line and extending from a longitudinal edge thereof, said full end flap being substantially equal in length to one-half said lengths of said first and second side panels, first and second cover flaps joined to said first and second side panels, respectively, along score lines and extending from longitudinal edges thereof such that said first and second cover flaps are correspondingly disposed to said full end flap, said first and second cover flaps having lengths less than that of said full end flap, the improvement comprising:

a first partial end panel coplanar with said first side panel and joined thereto along a score line opposite said score line joining said first side panel to said full end panel;

a second partial end panel foldably joined to said second side panel and extending toward said first partial end panel at least to abutting relationship;

a first partial end flap joined to said first partial end panel along a score line and extending from a longitudinal edge thereof, said first partial end flap being equal in length to and correspondingly disposed to said full end flap; and

a second partial end flap joined to said second partial end panel along a score line and extending from a longitudinal edge thereof, said second partial end flap being equal in length to and correspondingly disposed to said first partial end flap.

4,447,003

HINGED LID CONTAINER HAVING FINISHED EDGES

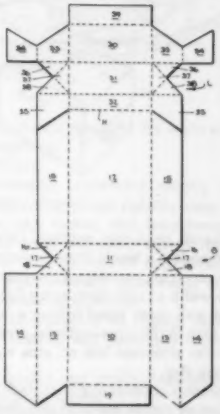
Sharon L. Gray, Cranbury, N.J., assignor to Alford Industries, Inc., Ridgefield Park, N.J.

Filed Jan. 17, 1983, Ser. No. 458,416
Int. Cl.³ B65D *85/10;* **A24F** *15/12*
U.S. Cl. 229—44 CB **20 Claims**

1. A one-piece container blank for the formation of a hinged lid container, the blank being creased, embossed or otherwise weakened along lines that divide the blank into first areas and second areas which when assembled form a container base defined by said first areas having an integral lid defined by said second areas,

said first areas comprising a base panel interposed between a front panel and a back panel, first side panels on opposite sides of the front panel, said first side panels having extension flaps along first edges thereof remote from said front panel, each of said first side panels having a second edge along which said first side panel is connected to said front panel, said second edge being parallel to and laterally spaced from said first edge;

said first areas also comprising second side panels on opposite sides of the back panel arranged to lap and be sealed to the extension flaps of the first side panels and positioned inboard thereof in a completed container constructed by erecting said container blank;



and said second areas comprising a lid back extending from the edge of the back panel remote from the base panel, a lid top extending from the edge of the lid back remote from the back panel, a lid front extending from the edge of the lid top remote from the lid back and lid front side panels having extension flaps along straight edges thereof remote from said lid front, each of said lid front side panels having a another edge along which said lid another side panel is connected to said lid front, said another edge being parallel to and laterally spaced from said straight edge, said lid back being furnished with lid back side panels to be sealed to the inside surfaces of the lid front side extension flaps.

4,447,004

CARTON HANDLE ARRANGEMENT

Richard F. House, St. Charles, and Karl A. Kohler, Roselle, both of Ill., assignors to Container Corporation of America, Chicago, Ill.

Filed Feb. 7, 1983, Ser. No. 464,708
Int. Cl.³ B65D *5/46*
U.S. Cl. 229—52 B **5 Claims**

1. A carrier carton for holding at least one article, said carton being formed from a unitary blank of foldable sheet material such as paperboard and comprising:

(a) a bottom wall panel;

(b) a pair of opposed side wall panels foldably joined to side edges of said bottom wall panel and upstanding therefrom;

(c) a top wall including integral handle means for lifting and carrying said carton, said top wall including a pair of inner and outer panels foldably joined to upper edges of respective side wall panels and secured to each other in lapped relation to form a tubular structure;

(d) said top wall inner panel including:

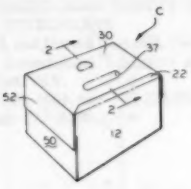
(i) a multi-finger receiving opening spaced inboardly from a side edge thereof;

(ii) an elongated reinforcing flap foldably joined to said side edge and adapted to be folded 180° and secured in face-to-face relation with the underside of said inner panel in the area between said opening and said side edge to provide, with said inner and outer panels three plies of carton material in said area;

(e) said top wall outer panel including:

(i) a multi-finger receiving opening of of substantially the same contour as and disposed to overlie said inner panel opening;

(ii) an integral strip of material disposed between said outer panel opening and a free side edge of said outer panel;



(iii) a thumb receiving opening, only large enough to accommodate a single thumb, spaced from said multi-finger receiving openings a distance substantially equal to the width of said reinforcing flap;

(f) said top wall outer panel having a contour substantially equal in area to the cross-sectional area of the upper end of said tubular structure less an area equal to that of said reinforcing flap;

(g) said openings cooperating with each other and with said three plies of carton material therebetween to provide a strong handle arrangement whereby when the top wall is grasped like a bowling ball twisting of the material of the carton between said openings is minimized.

4,447,005

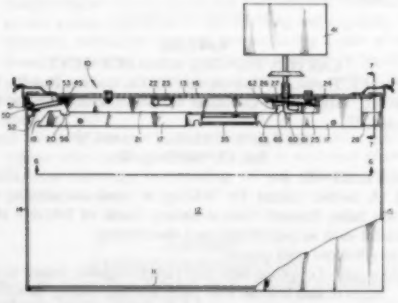
DOUBLE DOOR SECURITY RURAL MAILBOX WITH AUTOMATIC SIGNALLING MEANS

James B. Kelly, and Viola F. Kelly, both of 7255 Shelby St., Indianapolis, Ind. 46227

Filed Mar. 25, 1983, Ser. No. 478,642

Int. Cl.³ B65D *91/00*

U.S. Cl. 232—35 **15 Claims**



1. A mailbox comprising:

a mailbox main body with a mail carrier door and owner's door;

a signal flag mounted external to said main body and moveable to a first position associated with mail being in said main body and to a second position associated with said main body being empty of mail;

first means operatively associated with said mail carrier door and owner's door and operable to lock said mail carrier door once opened and closed until said owner's door is opened; and

second means operatively associated with said mail carrier door, said owner's door and said signal flag and interacting with said first means to move said signal flag to said first position when said mail carrier door is opened and to said second position when said owner's door is opened.

4,447,006

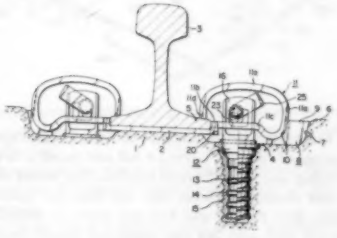
CAM TYPE ELASTIC RAIL FASTENING DEVICE

Yoshio Matsuo, Tokyo, Japan, assignor to Tetsudo Kizai Kogyo Company Limited, Tokyo, Japan

Filed Mar. 10, 1982, Ser. No. 356,752

Int. Cl.³ E01B *9/30*

U.S. Cl. 238—341 **4 Claims**



4. A device for clamping a rail to a base, comprising: an anchor mounted in said base and having a head projecting upwardly therefrom, a cam element mounted in said anchor for rotation about an axis parallel to said rail and for sliding motion lengthwise of its rotational axis, a spring member having an upper portion overlying said anchor and a lower portion receiving said upper portion of said anchor, said upper portion terminating in a downturned tip engaging said rail and said lower portion terminating adjacent said rail, means located outwardly of said anchor supporting said spring member remote from its tip, said cam element having a lobe and a lever, said cam lever being offset angularly with respect to said lobe and having a length greater than the spacing between the anchor and upper portion of the spring member, said cam element adapted, when said lobe is engaged with said lower portion of the spring member and said lever inclined away from the rail, to be slid axially into position beneath said upper portion of the spring member, whereby said spring member both clamps the rail and prevents the cam element from loosening inadvertently.

4,447,007

SWIVELLING DEVICE FOR SPREADING LIQUIDS BY SPRAYING

Jean-Michel Farines, 2 Avenue Fauvelle, 66300 Thuir, France

PCT No. PCT/FR81/00046, 371 Date Dec. 1, 1981, 102(e) Date Dec. 1, 1981, PCT Pub. No. WO81/02825, PCT Pub. Date Oct. 15, 1981

PCT Filed Apr. 1, 1981, Ser. No. 328,573

Claims priority, application France, Apr. 4, 1980, 80 07894

Int. Cl.³ B05B *1/20*

U.S. Cl. 239—165 **4 Claims**

1. A device for spraying a liquid which comprises in combination:

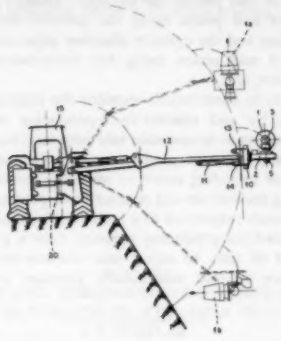
a vehicle adapted to travel along a site to be sprayed;

an arm articulated to said vehicle and provided with means enabling a free end of said arm to be moved to a location below said vehicle, to a location above the level of said

vehicle and to selective locations between said locations above and below said vehicle;

a support member pivotally connected with said arm for rotation relative thereto about a substantially horizontal first axis, said arm and said member being interconnected by means for rotating said member about said first axis;

a platform journalled on said member for rotation relative



thereto about a substantially horizontal second axis orthogonal to said first axis; and

an atomizing head mounted on said platform for angular displacement thereof about a third axis substantially orthogonal to said first and second axes, said head being provided with means for dispensing an atomized spray of said liquid in a pattern having a further axis substantially orthogonal to said third axis.

4,447,008

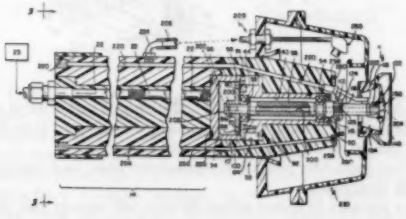
ATOMIZING DEVICE MOTOR

Harold T. Allen, Brownsburg, Ind., assignor to Ransburg Corporation, Indianapolis, Ind.

Continuation of Ser. No. 203,519, Nov. 3, 1980, Pat. No. 4,381,079. This application Sep. 20, 1982, Ser. No. 419,694

Int. Cl.³ B05B *3/04, 3/10*

U.S. Cl. 239—214.13 **3 Claims**



1. In combination, a fluid turbine motor, an atomizing device for high-speed rotation by the motor, means for feeding coating material to the atomizing device for atomization thereby, a shaft for mounting the atomizing device, means for coupling the shaft to the motor to spin the atomizing device, the shaft including means providing a passageway extending longitudinally therethrough, means for coupling a gas source to the passageway from a point remote from the atomizing device, and means providing an exhaust from the passageway at the atomizing device for exhausting gas therethrough.

4,447,009

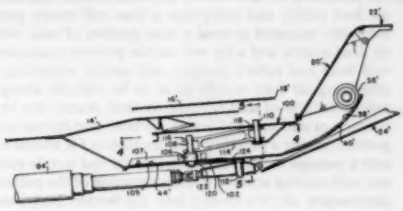
THREE-DIMENSIONAL AXIALLY TRANSLATABLE CONVERGENT/DIVERGENT NOZZLE ASSEMBLY

Walter H. Wiley, Palm Beach Gardens, and William M. Madden, Palm Springs, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 28, 1981, Ser. No. 334,493

Int. Cl.³ B64D *15/06*

U.S. Cl. 239—265.39 **7 Claims**



1. A variable area nozzle assembly for a gas turbine engine having an axis comprising:

engine fixed structure;

a unison ring assembly comprising radially inner axially translatable unison ring means, radially outer axially translatable unison ring means, and interconnection means connecting said inner and outer unison ring means and causing relative axial movement therebetween in accordance with a predetermined relationship during translation of said unison ring assembly;

at least one actuator adapted to engage said unison ring assembly and translate said inner and outer unison ring means;

a plurality of rotatable and axially translatable first flaps defining an upstream nozzle;

means connecting said flaps to said inner unison ring means;

a plurality of second flaps downstream of said first flaps and interconnected to said first flaps for rotation relative thereto, said second flaps being axially translatable and rotatable; and

means connecting said second flaps to said outer unison ring means.

4,447,010

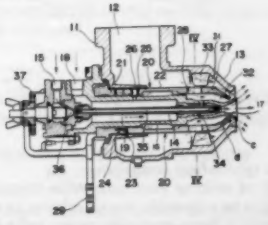
PROPORTIONAL REGULATION OIL BURNER OF LOW PRESSURE AIR TYPE

Yasunori Maeda, Nara, and Akinobu Yamasaki, Yamatokoriyama, both of Japan, assignors to Chugai Ro Co., Ltd., Osaka, Japan

Filed Feb. 26, 1982, Ser. No. 352,583

Int. Cl.³ F23D *13/38*

U.S. Cl. 239—414 **4 Claims**



1. A proportional regulation oil burner of low pressure air type, which comprises:

a burner body provided with a preheated combustion air feed port for introducing a preheated combustion air

thereinto and a restricted tip end frusto-conical opening portion for exhausting said introduced preheated combustion air;

an oil nozzle centrally disposed with said burner body for discharging oil including a tip end opening portion;

a cooling air feed nozzle disposed around said oil nozzle and having a tip end outwardly tapering, frusto-conical opening portion forwardly extending beyond a tip opening portion of said oil nozzle; and

an oil atomizing air feed nozzle disposed around said cooling air feed nozzle and comprises a base end rotary portion rotatably mounted around a base portion of said cooling air feed nozzle and a tip end nozzle portion connected to said base end rotary portion, and means mounting said atomizing air feed nozzle so as to be slidable along the axial direction of said cooling air feed nozzle due to the rotation of said base end rotary portion, said tip end nozzle portion having a plurality of holes therein for introducing, into a passage formed between said tip end nozzle portion and said cooling air feed nozzle, a portion of the preheated combustion air introduced into the burner body, and a frusto-conical tip opening portion positioned rearwardly of the tip end conical opening portion of the cooling air feed nozzle in a passage formed between the opening portion of said burner body and the opening portion of said cooling air feed nozzle;

whereby both an area of the opening formed between said opening portion of the burner body and the opening portion of the oil atomizing air feed nozzle and an area of the opening formed between the opening portion of the oil atomizing air feed nozzle and the opening portion of the cooling air feed nozzle are respectively varied according to the position of said tip end nozzle portion.

4,447,011

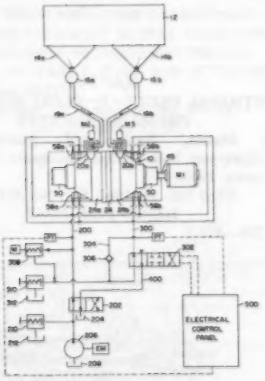
PLATE ADJUSTMENT SYSTEM

Stanley Prew, Montoursville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 91,083, Nov. 5, 1979, abandoned. This application Dec. 16, 1981, Ser. No. 331,068

Int. Cl.³ B02C *7/14*

U.S. Cl. 241—37 **12 Claims**



1. A disc type refiner comprising:

(a) a pair of refining plate assemblies constructed and arranged to be adjustably spaced relative to each other;

(b) an attrition force-producing means and a counter-force-producing means operatively connected to at least one of said refining plate assemblies, said attrition force-producing means being constructed and arranged to provide substantially all of the attrition force required for refining and said counter-force-producing means being constructed and arranged to continuously coact at a substantially constant predetermined value with the attrition reaction-force, produced during refining, in a direction opposite that produced by said attrition force-producing means, and said attrition force-producing means and said counter-force-producing means comprising a hydraulic piston-cylinder assembly provided with means to stimultaneously introduce pressurized hydraulic fluid to both sides of said piston, the cylinder chamber adjacent one side of said piston being the attrition force-producing chamber and the cylinder chamber adjacent to the other said of said piston being the counter-force-producing chamber; and

(c) means to continuously monitor the counter-force, produced by said counter-force-producing means during refining, so as to maintain said counter-force at said substantially constant predetermined value, said means to monitor including means to sense the counter-force-producing pressure in said counter-force-producing chamber and means responsive to a predetermined increase in said counter-force-producing pressure over a predetermined period of time to adjust said counter-force-producing pressure to said substantially constant predetermined value.

4,447,012

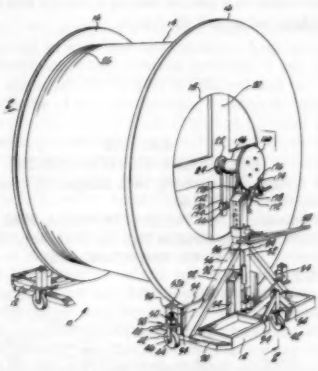
PORTABLE REEL JACK STAND

Harold F. Woodruff, 2340 Avocado Ter., Hacienda Heights, Calif. 91745

Filed Mar. 12, 1981, Ser. No. 242,982

Int. Cl.³ B65H *23/06, 75/40*

U.S. Cl. 242—54 R **7 Claims**



1. An apparatus adapted to lift and support a reel of cable or the like off the ground, the apparatus further adapted to facilitate rotation of the reel, the apparatus comprising:

(A) dual oppositely positioned reel support units, each support unit comprising:

(i) a plurality of rollers affixed to each reel support unit, the rollers retractable into the support units when the support units have lifted the reel from the ground, the rollers adapted to facilitate movement of the reel support units when not retracted,

(ii) a first telescopic member slidably engaged with each of the reel support units,

(iii) a second telescopic member slidably engageable with the first telescopic member, the second telescopic member including means for engaging the first telescopic member to support the reel above the ground;

(iv) means for imparting a lifting force on the first telescopic member,

(v) indexing means for supporting the first telescopic member and the reel, and

(vi) means for engaging the reel, the engaging means affixed to the second telescopic member, the engaging means adapted to facilitate rotation of the reel when lifted from the ground, and

(B) means for braking rotation of the reel, the braking means including a disk brake assembly operative with at least one of the reel engaging means to occasion braking of the reel.

4,447,013

METHOD AND ARRANGEMENT ON EXTRACTING, REELING UP, PULLING IN, ETC., OF A HEAVY CABLE OR SIMILAR

Bror Sandered, Norsborg; Rune Carlsson, Västra Frölunda, and Bengt Andersson, Älvängen, all of Sweden, assignors to MEAB, Mobile Equipment AB, Mölndal, Sweden

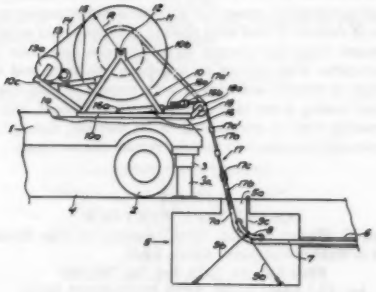
PCT No. PCT/SE81/00119, 371 Date Dec. 17, 1981, 102(e) Date Dec. 17, 1981, PCT Pub. No. WO81/03089, PCT Pub. Date Oct. 29, 1981

PCT Filed Apr. 22, 1981, Ser. No. 333,873

Claims priority, application Sweden, Apr. 23, 1980, 8003049

Int. Cl.³ B65H *75/40*

U.S. Cl. 242—54 R **11 Claims**



1. Method for extracting, reeling up, or pulling-in of a heavy cable or other long flexible object utilising a main frame adapted to be set up on a vehicle, the main frame including a base unit made up of a number of beams and two bearing brackets projecting upwards from long sides of the base unit, a drum freely rotatably arranged on the bearing brackets on the main frame, driving means for the drum including a motor unit and a transmission component for operatively connecting the motor unit to drive the drum, comprising the steps of connecting a pulling device both to a core of the cable and to a pull-free mechanism fixed to the main frame, activating the pull-free mechanism to effect a small longitudinal displacement of the cable and to cause the cable to be pulled free from a cable duct, disconnecting the pulling device after the cable has been pulled free, pulling the core up towards and anchoring the core on the drum, activating the motor unit to turn the drum to accomplish the subsequent main part of the longitudinal displacement of the cable by direct winding onto the drum.

4,447,014

TIRE COMPONENT ASSEMBLY

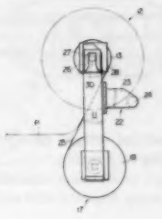
Yusaku Azuma, Higashimurayama; Yoshifumi Kitayama, Kodaira, and Chiaki Ozawa, Higashimurayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Feb. 25, 1982, Ser. No. 352,453

Claims priority, application Japan, Mar. 3, 1981, 56-30116

Int. Cl.³ B65H *75/02, 17/02*

U.S. Cl. 242—55 **1 Claim**



1. A tire component storing assembly, comprising in combination;

a frame structure comprising a pair of side plate members spaced apart from and substantially in parallel with each other,

a first reel having opposite end portions rotatably supported on said side plate members, respectively, of said frame structure,

a second reel having opposite end portions rotatably supported on said side plate members, respectively, of said frame structure, said second reel spaced apart from and substantially in parallel with said first reel,

a liner having one end wound at all times on said first reel and the other end wound at all times on said second reel to form layers thereon, whereby a tire component is wound on any one of said first and second reels while intervening between the layers of the liner to be wound on any one of said first and second reels,

a pair of coupling members respectively projecting from the side plate members of said frame structure, a pair of supporting members for supporting said coupling members and said frame structure, the coupling members respectively having a pair of box-shaped recesses for receiving said supporting members and opening outwardly of said side plate members of said frame structure and having center axes substantially in alignment with each other, and grooves in communication with the recesses for facilitating insertion of the supporting members into the recesses, the grooves being open downwardly of said side plate members of said frame structure and having cross sections tapered toward the lower ends of the coupling members and toward said side plate members, and

reinforcing means for reinforcing said side plate members of said frame structure.

4,447,015

TOILET TISSUE DISPENSING DEVICE

Kenneth E. Peterson, 9617 Little Cir., Bloomington, Minn. 55437

Filed Nov. 1, 1982, Ser. No. 438,055

Int. Cl.³ B65H *19/00*

U.S. Cl. 242—55.2 **2 Claims**

2. A toilet tissue dispensing device in connection with a fixture holding the same, said device having in combination

a tubular roller having thereon a roll of toilet tissue,

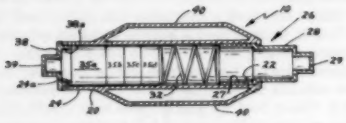
said roller comprising a hollow body having open ends,

a plurality of flexible longitudinal ribs integral with said body and projecting outwardly thereof spaced thereabout,

an annular flange at one end of said body,

a cylindrical end plug having a portion thereof disposed into said body through said one end thereof, said end plug having an annular shoulder engaging the inner side of said annular flange being retained thereby, said end plug having a portion of reduced diameter extending outwardly of said body forming a pivot,

a compression spring disposed within said body abutting said end plug,



a plurality of cylindrical weight members disposed within said body engaging said spring,

an end plug forming a pivot being externally threaded at one end thereof and being disposed into said other end of said body, and

said weight members being adjusted as to weight to the tear strength of said roll of toilet tissue, said weight being such as to restrain the rotation of said roller upon removal of sheets from said roll of tissue thereon and thus prevent the free rotation of said roller.

4,447,016

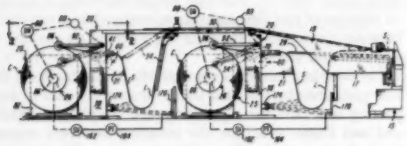
REWIND APPARATUS FOR METAL STRIPS

Erik R. Enberg, Troy, and J. Douglas Plank, Piqua, both of Ohio, assignors to Perfecto, Inc., Piqua, Ohio

Filed Jun. 1, 1982, Ser. No. 383,717

Int. Cl.[3] **B65H** *59/00;* **B21C** *47/02*

U.S. Cl. 242—56.9 **15 Claims**



10. Apparatus for simultaneously rewinding a plurality of substantially parallel metal strips into corresponding coils after the strips are cut from a wide strip and adapted to form the coils with generally uniform tension within the strips independent of variations in the thickness and stretch of the strips, said apparatus comprising a rewind unit including a horizontal rewind mandrel having a power driven center shaft, said mandrel including a plurality of axially aligned mandrel sections mounted on said shaft for independent free rotation and adapted to receive the leading end portions of corresponding strips, each of said mandrel sections including a pair of coil support shoes each movable generally radially between a retracted position and an extended position, a corresponding plurality of air operated cylindrical clutches surrounding said shaft and providing for independently driving said mandrel sections from said shaft, means defining a plurality of axially extending air passages within said shaft and connected to corresponding said air operated clutches, means for producing a loop in each strip, a corresponding plurality of air actuated tension units each having a set of rolls for applying a generally uniform tension within the strips between said loop forming means and said rewind unit, a corresponding plurality of optical loop detectors for independently sensing variations in the corresponding loops within the strips, and means responsive to said loop detectors for variably changing the air pressures within the corresponding said fluid operated clutches.

4,447,017

SEATBELT WEBBING RETRACTING DEVICE

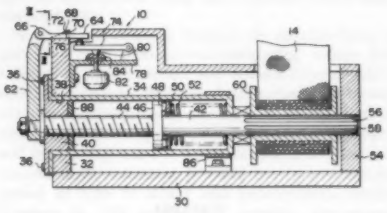
Mitsuo Inukai, Nagoya, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Tokai-Riki-Denki-Seisakusho, both of Aichi, Japan

Filed Mar. 31, 1981, Ser. No. 249,478

Claims priority, application Japan, Mar. 31, 1980, 55-42534[U]

Int. Cl.[3] **A62B** *35/02;* **B65H** *75/42, 75/48*

U.S. Cl. 242—107.4 A **10 Claims**



1. A seatbelt webbing retracting device for retracting a webbing fastened to an occupant in an emergency of a vehicle such as a collision so as to improve the performance of restraining the occupant, comprising:

(a) a base mounted on a vehicle body;

(b) a main shaft threadedly connected to said base;

(c) a biasing means for biasing said main shaft in the axial direction of said main shaft;

(d) transmitting means for transmitting a moving force of said main shaft generated by a biasing force of said biasing means to the webbing;

(e) an engaging means comprising an arm tiltably supported on said main shaft and engageable with a stopper provided on said base to prevent said main shaft from rotating; and

(f) an acceleration sensor for actuating said engaging means with respect to said main shaft to disengage said engaging means from said stopper so as to make said main shaft rotatable with respect to said base, whereby said main shaft is rotated and moved with respect to said base by said biasing force in the axial direction thereof, and said moving force is transmitted to the webbing through said transmitting means to thereby retract the webbing.

4,447,018

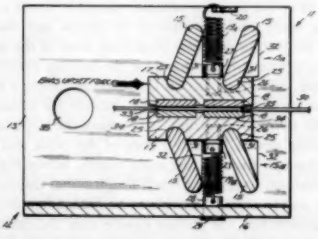
TOGGLE TYPE WEB LOCK

Wallace C. Higbee, Romeo, Mich., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Feb. 26, 1982, Ser. No. 352,899

Int. Cl.[3] **A44G** *11/06;* **A62B** *35/00;* **F16D** *59/02*

U.S. Cl. 242—107.2 **1 Claim**



1. In a toggle type seat belt webbing lock structure, the combination comprising:

a channel shaped frame having upstanding parallel spaced-

apart legs and the legs thereof defining plural pairs of aligned and juxtaposed butterfly shaped openings;

a spreader bar intermediate said legs;

a pivot bar in each of said butterfly slots and transversely across said channel shaped frame;

a pair of juxtaposed clamp blocks in spaced-apart parallel relation between said legs of said frame, each having spaced-apart grooves forming outer pockets for operative engagement with edges of said extending pivot bars and said clamp blocks having registering depressions in the facing portions thereof;

inserts of slightly deformable material with excellent memory characteristics, each retained in said depressions in said clamp blocks and having work faces projecting outwardly toward a registering and facing insert;

a spring bias connected to each of said clamp blocks and urging them away from each other and limited by said butterfly openings;

guide links coordinating movement of all of said bars and operably connected over at least a pair of the ends of said pivot bars;

means selectively actuatable in a motion generally parallel to a plane between said clamp blocks, said motion displacing said clamp blocks and closing said blocks toward each other on said guide links; and

a web belt movable between said blocks in a plane parallel generally to the actuatable means and engaged by said inserts as said clamp blocks close toward each other, the direction of pull thereafter urging a tighter grip by said inserts on said web belting.

4,447,019

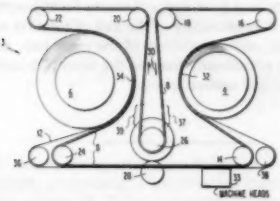
MAGNETIC TAPE CARTRIDGE WITH RESILIENT BELT DRIVING MEANS AND SEPARATE TAPE AND BELT IDLERS

Boguslaw A. Nagorski, San Jose, Calif., assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 30, 1981, Ser. No. 307,147

Int. Cl.³ G11B *15/26, 23/04*

U.S. Cl. 242—192 **8 Claims**



1. A tape cartridge having a take-up reel and a supply reel for taking up and supplying a tape for use in a recording machine having heads, comprising:

a continuous resilient belt, said belt supporting said tape in the vicinity of said machine heads;

means for driving said belt so that said belt contacts a portion of said take-up reel and said supply reel causing said reels to turn;

a first set of idlers for guiding said belt as said belt is transported from said portion of said supply reel to said portion of said take-up reel;

a second set of idlers for guiding only said tape and not said belt as said tape and said belt are transported from said portion of said supply reel to said portion of said take-up reel.

4,447,020

MAGNETIC RECORDING TAPE CARTRIDGE

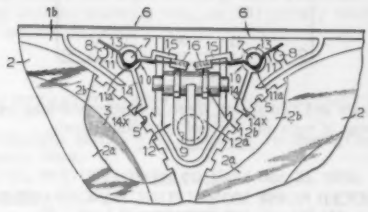
Mitsuharu Toi, Kyoto, and Hiroyoshi Takagi, Kameoka, both of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed May 13, 1982, Ser. No. 377,825

Claims priority, application Japan, May 14, 1981, 56-70253[U]

Int. Cl.³ G03B *1/04;* G11B *15/32*

U.S. Cl. 242—198 **4 Claims**



1. A magnetic recording tape cartridge which comprises:

a bottom section,

a top section mated with said bottom section to form a cartridge case,

a pair of tape reels each having a flange and a hub member on which a magnetic recording tape is wound, said flange being provided with a plurality of engaging teeth on the peripheral edge of said flange,

a tape reel stopping means having a boss member, a first arm extending radially from said boss member to provide a rotation preventing member which detachably engages with one of the engaging teeth of said flange and a second arm extending from said boss member with a spring receiving member formed on a free end thereof, said tape reel stopping means being rotatably pivoted on pivotal shafts of the bottom section, and

a resilient plate spring formed by a generally flat plate having its intermediate portion bent, said plate spring being situated standing vertically in a space defined by said boss member of the tape reel stopping means and a spring supporting member formed on the bottom section with one flat end of the plate spring being received by said spring receiving member, said bent portion of the plate spring being engaged with one of said pivotal shafts for preventing lateral displacement of said plate spring, said plate spring biasing said second arm of said tape reel stopping means for engagement of said rotation preventing member with one of the teeth of said flange, so that at least one of said tape reels is prevented from rotation when the magnetic recording tape cartridge is not being used.

4,447,021

TAPE CARTRIDGE OF CASSETTE SYSTEM

Tokuzo Shimizu, 2-4-7, Tamagawa Denenchofu, Setagaya-ku, Tokyo, Japan

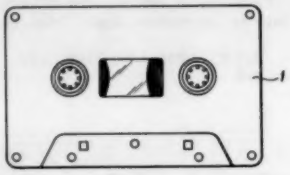
Filed Feb. 22, 1982, Ser. No. 350,656

Int. Cl.³ G03B *1/04;* G11B *15/32*

U.S. Cl. 242—199 **9 Claims**

1. Tape cartridge cassette system having right and left reel

hubs including sliding sheets mounted within a cassette half made in circular form of a size almost a same size as a wound



tape body and said sliding sheets rotatably provided on both side faces of right and left reel hubs, respectively.

4,447,022

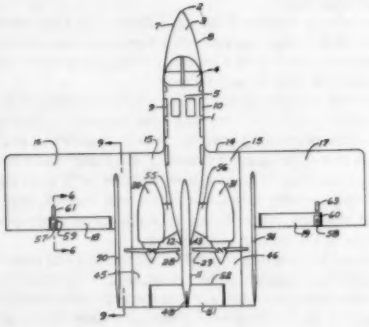
REDUCED NOISE MONOLITHIC WING-STABILIZER AIRCRAFT

Charles E. Lion, 253 Euclid Ave., Ridgway, Pa. 15853

Filed May 21, 1982, Ser. No. 380,558

Int. Cl.³ B64C *1/00, 5/02, 15/14*

U.S. Cl. 244—13 **3 Claims**



1. An aircraft comprising: (A) a fuselage having a porpoise shaped nosewindshield extending midlength to a rectangular shape and further in the rear to a transverse vertical lenticular crossection with side walls of said fuselage forming decreasing minor arcuate portions of a cylinder blending into a tall vertical stabilizer fin tail section containing a rudder recessed into the trailing edge of said tall vertical stabilizer and movably attached upstream from the trailing edge of said tall vertical stabilizer; and (B) wings connected to said fuselage containing movably mounted ailerons recessed inboard from tips of said wings, said ailerons extending further inboard to a point of operational clearance adjacent to the intersection of auxiliary vertical stabilizers, said auxiliary vertical stabilizers extending from near the leading edge of said wings parallel to said fuselage, thusly ending flush with said tall vertical stabilizer trailing edge; and (C) a monolithic wing-horizontal stabilizer, said horizontal stabilizer beginning as a rearward extension of said wings, said horizontal stabilizer extending aft of said fuselage and ending flush with an elevator movably mounted into said horizontal stabilizer, said elevator spanning horizontally outward from the intersection with, and on each side of, said tall vertical stabilizer to meet rearward extensions of said horizontal stabilizer and extending rearward to be flush with said horizontal stabilizer trailing edge, and whose leading edge is hinged to the trailing edge of said horizontal stabilizer, said horizontal stabilizer being a rearward continuance of said wings, and extending off said fuselage at wing level outward to end just inboard of said ailerons; and (D) said tall tail vertical stabilizer fin originating on the top centerline of said fuselage extending rearward to be flush with the trailing edge of said horizontal stabilizer extensions and said elevator containing a rudder superimposed into said vertical stabilizer trailing edge, hinged upstream in said vertical stabilizer to form a movable horizontal control about the vertical axis of said aircraft; and (E) a pair of pusher type engines juxtaposed and symetrically attached to the aft end of said fuselage and on each side of said vertical stabilizer with just sufficient clearance to allow safe engine propeller operation.

4,447,023

APPARATUS FOR MOUNTING A DEVICE ABOVE A HELICOPTER ROTOR

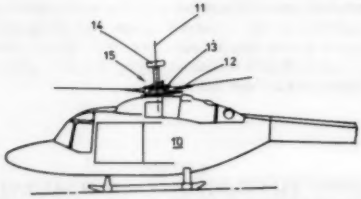
Peter Reid, Hardington Mandeville, nr. Yeovil, England, assignor to Westland plc, Yeovil, England

Filed Apr. 13, 1982, Ser. No. 367,960

Claims priority, application United Kingdom, Apr. 27, 1981, 8112941

Int. Cl.³ B64C *27/04*

U.S. Cl. 244—17.11 **12 Claims**



1. A helicopter having a main sustaining rotor comprising a rotor hub and a plurality of radially extending rotor blades arranged for rotation about a generally vertical axis and including apparatus for supporting a stationary or independently rotatable device above the rotor, wherein said apparatus comprises a first ring gear below the rotor hub and supported from helicopter structure concentrically of the axis of rotation, a second ring gear above the rotor hub having the same number of gear teeth as the first gear, support means for supporting the second ring gear concentrically of the axis of rotation and in a manner permitting relative rotation of the rotor hub, and synchronising means rotationally fixed to the rotor hub and meshing with said first and second gears.

4,447,024

AIRBORNE VEHICLE

Sam B. Williams, Walled Lake, Mich., assignor to Williams International, Walled Lake, Mich.

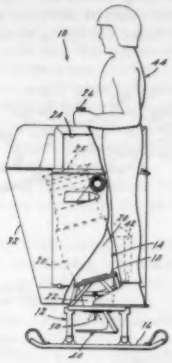
Filed Feb. 8, 1982, Ser. No. 346,751

Int. Cl.³ B64C *29/00*

U.S. Cl. 244—23 A **9 Claims**

1. An airborne vehicle comprising a frame for the support of an operator in an erect standing position, and a jet engine mounted on said frame for direct lift of said operator, engine and frame, said frame being attached to the lower end of said engine and said engine constituting the vertically extending backbone of said vehicle, the central axis of said engine being inclined upwardly and forwardly relative to a transverse vertical plane extending through the center of gravity of the vehicle, the center of gravity of said engine being disposed on one

side of the thrust line thereof and the center of gravity of said operator being disposed on the opposite side of the thrust line



of said engine whereby the center of gravity of said vehicle is on said thrust line when said vehicle is airborne.

4,447,025

CARRIER FOR A DROPLOAD TO BE DROPPED FROM AN AIRCRAFT

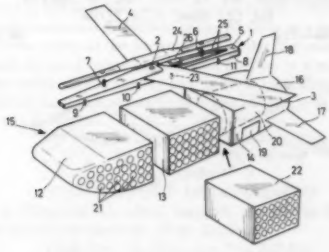
Siegfried Bock, Kirchseeon, and Horst Huetter, Tegernsee, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Jul. 28, 1982, Ser. No. 402,563

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1981, 3132190

Int. Cl.³ B64D *1/02*

U.S. Cl. 244—118.2 **4 Claims**



1. A carrier flying craft for a dropload to be dropped from an aircraft, comprising a longitudinal carrier body (**1**), first securing means (**6**, **7**) for releasably connecting said carrier body to an aircraft, a plurality of separate dropload members (**12**, **13**, **14**), second securing means (**9**, **10**, **11**) for releasably connecting said dropload members (**12**, **13**, **14**) to said carrier body (**1**) for forming a carrier body load combination constituting said flying craft, wing means (**3**, **4**) and hinge means (**2**) including unfolding drive means (**26**) for operatively connecting said wing means to said carrier body for holding the wing means substantially in longitudinal alignment with the carrier body when the carrier body is secured to an aircraft and for unfolding said wing means when the carrier body is released from an aircraft, whereby the flight of a load to the ground is controllable, said carrier flying craft further comprising propulsion means (**20**) forming part of the carrier body load combination, tail unit means (**16**) forming part of the carrier body load combination, electronic autopilot means (**19**) operatively connected for controlling the operation of said tail unit means, wherein said tail unit means comprise rudder flap means (**18**) and elevator flap means (**17**) for steering the carrier body load combination during its descent flight by said electronic autopilot means, and wherein one of said dropload members forms an aerodynamically shaped nose cone member (**12**) which is longitudinally spaced from said tail unit means to provide intermediate space for at least one further dropload member (**13**, **22**), at least one of said dropload members having cavities for receiving scattering weapons (**21**), said cavities extending substantially at right angles to a longitudinal axis of said carrier flying craft for scattering weapons (**21**) laterally away from said carrier flying craft.

4,447,026

CAM OPERATED COUNTERBALANCE ASSEMBLY FOR AIRCRAFT DOORS

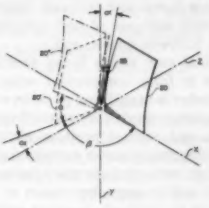
Alex Maraghe, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

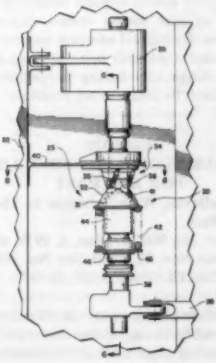
PCT No. PCT/US82/01782, 371 Date Dec. 21, 1982, 102(e) Date Dec. 21, 1982

PCT Filed Dec. 21, 1982, Ser. No. 474,651

Int. Cl.³ B64C *1/14*

U.S. Cl. 244—129.5 **22 Claims**





1. Apparatus for reducing the torque required to manually rotate a movable structural member about a canted hinge axis comprising, in combination:

(a) a fixed structural member;

(b) a torque tube mounted on said fixed structural member, said torque tube lying in a plane defining an acute included angle α with the vertical and defining an inclined hinge axis;

(c) a movable structural member;

(d) hinge means for coupling said movable structural member to said torque tube for permitting rotation of said movable structural member and said torque tube about said inclined hinge axis with said movable structural member rotating between first and second positions and wherein said movable structural member is constrained

for movement in an upslope direction about said inclined hinge axis during at least a portion of rotation thereof from said first to said second position and for movement in a downslope direction during at least a portion of rotation thereof from said second to said first position;

(e) cylindrical cam means mounted concentrically about said torque tube and co-axial therewith, said cylindrical cam means defining an axially presented cylindrical ramp-like cam face;

(f) cam follower means mounted concentrically about said torque tube and co-axial therewith; said cam follower means including a plurality of cam rollers engaged with said cylindrical ramp-like cam face;

(g) one of said cylindrical cam means and said cam follower means being fixedly mounted on said fixed structural member;

(h) the other of said cylindrical cam means and said cam follower means being nonrotatably mounted on said torque tube with freedom for axial movement therealong;

(i) axially compressible and expandable spring means mounted concentrically about said torque tube and having one end thereof restrained from axial movement relative to said torque tube and the other end thereof bottomed on said other of said cylindrical cam means and said cam follower means for normally biasing said other of said cylindrical cam means and said cam follower means into engagement with said one of said cylindrical cam means and said cam follower means; and,

(j) said cylindrical cam means being profiled so that said spring means is fully compressed when said movable structural member is in said first position so that when said movable structural member is rotated from said first position towards said second position about said inclined hinge axis, said spring means is permitted to expand axially as said movable structural member moves in an upslope direction and said torque tube rotates to cause said cam follower means to relatively traverse said ramp-like cam face whereby the other of said cylindrical cam means and said cam follower means imparts rotational torque to said torque tube as said spring means expands axially to thereby reduce the manual exertion required to rotate said movable structural member in an upslope direction about said inclined hinge axis during movement thereof from said first position to said second position.

4,447,027

UPPER SURFACE BLOWN POWERED LIFT SYSTEM FOR AIRCRAFT

Timothy Wang, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 000,117, Jan. 2, 1979, abandoned. This application Nov. 12, 1980, Ser. No. 206,173

Int. Cl.³ B64C *3/38, 21/04*

U.S. Cl. 244—212 **32 Claims**

1. An upper surface blown powered lift system comprising

a. an airfoil assembly having a chordwise axis and a leading edge and a trailing edge, said airfoil assembly providing a substantially continuous upper aerodynamic surface, said airfoil assembly comprising:

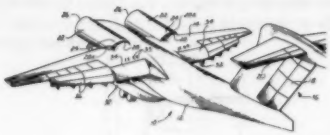
1. an airfoil having an upper airfoil surface that has a leading edge and a trailing edge and forms a forward portion of said upper aerodynamic surface,

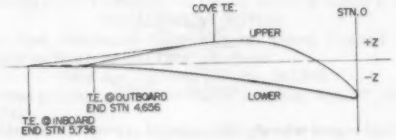
2. a flap means having an extended position extending downwardly and rearwardly from the trailing edge of the airfoil, with said flap means having an upper flap surface that forms a rear portion of said upper aerodynamic surface, and a trailing edge portion which forms the trailing edge of the airfoil assembly,

b. jet means to direct a high velocity jet flow rearwardly over the upper flap surface,

c. vortex generating means mounted rearwardly of said jet means to produce vortices in the jet flow over the upper flap surface,

d. said upper flap surface being curved in a generally chordwise direction and having a forward upper flap surface portion and a rear flap surface portion, said forward flap surface portion being curved in a relatively tight curve with overall lesser radius of curvature, said rear upper flap surface portion being curved in a more relaxed curve





having overall greater radius of curvature, said upper flap surface being characterized in that a forward half of the upper flap surface has a total degree of curvature greater than that of a rear half of said upper flap surface and causes greater deflection of said jet flow than the rear half of the upper flap surface.

4,447,028

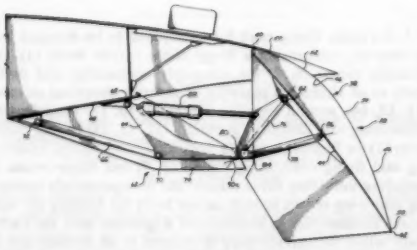
UPPER SURFACE BLOWN POWERED LIFT SYSTEM FOR AIRCRAFT

Timothy Wang, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 116, Jan. 2, 1979, abandoned. This application Nov. 12, 1980, Ser. No. 206,174

Int. Cl.³ B64C *3/38, 21/04*

U.S. Cl. 244—212 **80 Claims**



1. An upper surface blown powered lift system comprising:

a. an airfoil assembly having a chordwise axis and a leading edge and a trailing edge, said airfoil assembly providing a substantially continuous upper aerodynamic surface, said airfoil assembly comprising:

1. an airfoil having an upper airfoil surface that has a

leading edge and a trailing edge and forms a forward portion of said upper aerodynamic surface, said airfoil having a cove portion at the trailing edge,

2. a flap means having an extended position extending downwardly and rearwardly from the trailing edge of the airfoil, with said flap means having an upper flap surface that forms a rear portion of said upper aerodynamic surface, and a trailing edge portion which forms the trailing edge of the airfoil assembly, said flap means having a stowed position in said cove portion,

b. jet means to direct a high velocity jet flow rearwardly over the upper flap surface,

c. vortex generating means mounted rearwardly of said jet means to produce vortices in the jet flow over the upper flap surface,

d. said upper flap surface being curved in a generally chordwise direction and having a forward upper flap surface portion and a rear flap surface portion, said forward flap surface portion being curved in a relatively tight curve with overall lesser radius of curvature, with the forward upper flap surface portion having its radius of curvature gradually increasing from a forward end to a rear end of said forward upper flap surface portion, said rear upper flap surface portion being curved in a more relaxed curve having overall greater radius of curvature, said upper flap surface being characterized in that a forward half of the upper flap surface has a total degree of curvature greater than that of a rear half of said upper flap surface and causes greater deflection of said jet flow than the rear half of the upper flap surface,

e. actuating means to move said flap means between its stowed position and its extended position, and also to intermediate positions between its stowed and extended positions, said actuating means being arranged to rotate said flap means rearwardly with a moveable instantaneous center of rotation, with the upper flap surface being adjacent to and generally aerodynamically aligned with the airfoil upper surface at said cove portion,

whereby said flap member can be placed in the stowed position for travel in cruise mode, and deployed downwardly to create a desired downward deflection of the jet flow, in a manner that jet flow travelling at the forward end of the flap means travels over said forward upper flap surface portion in a curved path of lesser radius of curvature, and jet flow travelling over said rear end of the flap member travels in a curved path of greater radius of curvature.

4,447,029

LOAD SUPPORT ARRANGEMENT

Leslie J. Chapman, Alresford, England, assignor to Keith Hancock Structures Limited, Alton, England

Filed Apr. 12, 1982, Ser. No. 367,152

Claims priority, application United Kingdom, Jun. 23, 1981, 8119339

Int. Cl.³ A47G *29/02*

U.S. Cl. 248—246 **6 Claims**

1. A cantilever storage rack support arrangement, comprising

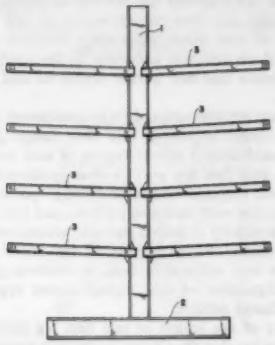
a vertical support standard including at least one extending flange forming a slideway,

a cantilever arm selectively positionable along the length of said vertical support standard and having a free end remote therefrom displaceable in a horizontal plane,

first and second plate members mounted on said cantilever arm remote from the free end thereof and normally disposed in sliding interfacial relation with said extending flange for guiding said cantilever arm along said slideway,

said first plate member having a lower marginal edge portion and said second plate member having an upper marginal edge portion disposable in progressively increasing compressive engagement on opposite sides of said extending flange in response to vertical loading of said cantilever arm towards a horizontal position to hold said cantilever arm in selected position on said upright when under load,

at least one of said plate members having a side marginal edge portion cantable into compressive engagement with



said flange in response to horizontal displacement of the free end of said cantilever arm to maintain said cantilever arm in selected position on said support standard preparatory to load application thereto.

4,447,030

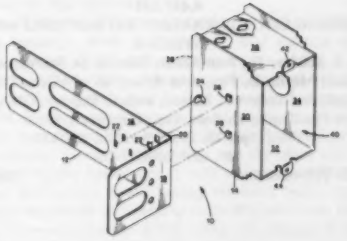
ELECTRICAL WIRING BOX ARRANGEMENT

William Nattel, Montreal, Canada, assignor to Commander Electrical Materials, Inc., St. Jean, Canada

Filed Mar. 30, 1981, Ser. No. 248,933

Int. Cl.³ G12B *9/00*

U.S. Cl. 248—27.1 **5 Claims**



1. An electrical wiring box arrangement for mounting on a metal supporting structure of the type having substantially parallel first and second flange portions and a web portion disposed therebetween, said flange portions each having first and second corner regions, the wiring box arrangement comprising:

an electrical wiring box having front-to-rear walls and a rear wall therebetween defining a chamber with a forward opening adapted to receive a wiring device; and

a mounting bracket for attachment to said wiring box and for mounting to said metal supporting structure, said mounting bracket having first and second deformable leg portions disposed to form a substantially right angle with one another;

said first leg portion having a plurality of sets of spaced apart openings adapted to coact with attachment means disposed in said front-to-rear wall structure of said wiring box to attach said wiring box to said mounting bracket with the plane of said forward opening of said box spaced apart and projecting forward of the plane of said second leg portion of said mounting bracket by a selected one of a like plurality of distances;

said second leg portion adapted to be positioned against said first flange portion of said metal supporting structure between said first and second corner regions thereof in preparation for mounting said bracket to the supporting structure, said second leg portion arranged initially to extend past said first corner region of said first flange portion of said metal supporting structure and, when deformed, to conform generally to the configuration of and embrace said first corner region of said first flange portion;

said first leg portion adapted to be positioned against said second corner region of said first flange portion and against said second corner region of said second flange portion, said first leg portion thus positioned to lie between said first and said second flange portions substantially parallel with said web portion, said first leg portion arranged initially to extend past said second corner region of said second flange portion of said metal supporting structure and, when deformed, to conform generally to the configuration of said second corner region of said second flange portion;

the balance of the length of said first leg portion of said mounting bracket thus being positioned against said second flange portion of said supporting structure between said first and said second corner regions thereof, the balance of said first leg portion arranged initially to extend past said first corner region of said second flange portion and, when deformed, to conform generally to the configuration of and embrace said first corner region of said second flange portion of said supporting structure;

whereby said wiring box arrangement is caused to be firmly mounted to said supporting structure with the plane of said forward opening of said wiring box projecting and spaced apart from the plane of said first flange portion of said supporting structure.

4,447,031

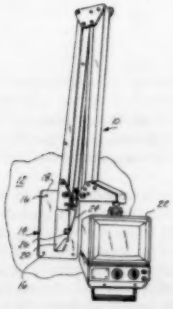
SPRING COUNTERBALANCED SUPPORT ARM SYSTEM

James J. Souder, Jr., Ann Arbor; Edward D. Scarborough, Jr., Inkster; Merlin D. Fox, Ann Arbor, all of Mich.; Donald R. Rettich, and Robert L. Mason, both of Dayton, Ohio, assignors to Positioning Devices, Inc., Cincinnati, Ohio

Filed Apr. 13, 1981, Ser. No. 253,438

Int. Cl.³ E04G *3/00*

U.S. Cl. 248—280.1 **16 Claims**



1. A counterbalanced swinging arm including a parallelogram linkage for supporting a load in various adjusted positions of said arm while counterbalancing said load in any of said positions, said parallelogram linkage comprising:

a pair of parallel links;

a first bracket;

means pivotally mounting one end of each of said links to said first bracket;

a second bracket and means pivotally mounting the other end of each of said links to said second bracket;

means for supporting said first bracket for enabling outward swinging movement of said links on said pivotal mounts;

means for attaching a load to said second bracket;

spring means connected to act on said second bracket and on at least one of said links along a line of direction so as to resist rotation of said one of said links about said pivotal mounts thereof in a direction opposite to a moment created by the weight of said attached load, said spring means located to exert a spring force acting with increasing leverage on said pivotal mount through a range of motion of said parallelogram linkage in swinging outwardly away from said first bracket thereby to produce a counterbalancing moment with outward movement of said parallelogram linkage to thereby offset the increase in moment exerted by said attached load with said outward arm motion;

adjustable friction brake means introducing a frictional braking force into said pivotal mounts of one of said links;

whereby a frictional braking force resisting said pivotal movement is introduced into said parallelogram linkage to absorb any unbalanced moment exerted by said attached load and spring means at positions of said parallelogram linkage as said arm undergoes said swinging motion.

4,447,032

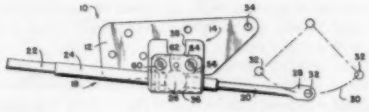
MULTIPLE-TYPE CABLE MOUNTING APPARATUS AND METHOD

Roger F. Olsen, Cuyahoga Falls, Ohio, assignor to Incom International Inc., Pittsburgh, Pa.

Filed Mar. 22, 1982, Ser. No. 360,534

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—558 **8 Claims**



6. Cable mount apparatus comprising a support block having at least one groove extending therethrough and opening outwardly along a face of the block for mountingly receiving an end fitting of a cable conduit, said groove having an enlarged central pocket portion configured to rotatably receive a pivot member extending transversely from the end fitting, and a retainer detachably connected to the block to close the groove and thereby hold an end fitting in the groove, the retainer being a U-shape retainer having leg portions detachably connected to the block, the base of the retainer closing said groove opening to hold the end fitting in the groove and the support block being provided with at least one opening configured to receive a mounting bolt, a mounting plate being provided with a plurality of spaced openings alignable with the openings in the block for receiving a mounting block extending through the block and at least one mounting bolt being provided for selectively securing the block to the plate at any one of said plurality of spaced openings.

4,447,033

WEIGHT BALANCER

Leonhard Jaumann; Zdenek Tima, and Heinz Feierlein, all of Munich, Fed. Rep. of Germany, assignors to Sachtler GmbH Filmtechnische Gerate, Fed. Rep. of Germany

Filed Jul. 9, 1981, Ser. No. 281,601

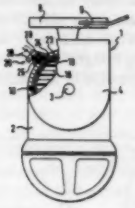
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1980, 3026379

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—563 **9 Claims**

1. An apparatus for counterbalancing the weight of an object

during a pitch movement thereof, said apparatus having a stator, a rotor rotatable around said stator in the pitch direction and adpated to support said object, and an accumulator between said stator and rotor that exerts upon said rotor during a pitch movement a restoring torque opposite to the torque



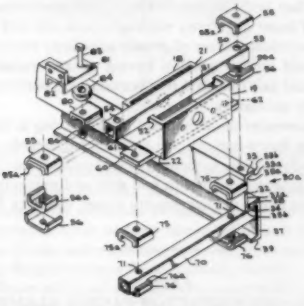
given by said object; the improvement comprising several independent accumulators placed between said stator and rotor and engaging means adapted to selectively operatively engage said several independent accumulators with said stator and rotor.

4,447,034

VIBRATION DAMPING BASE

Clifford E. Gottlob, Arkansas City, Kans., assignor to Gottlob Engine Conversions, Inc., Arkansas City, Kans.

Filed Oct. 23, 1981, Ser. No. 315,299
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—634 **23 Claims**



1. A vibration damping base for an engine and an output shaft connected to it comprising:

a supporting base,

means for mounting an engine on said base,

shaft bearing means, and means for supporting said shaft bearing means comprising:

(a) plate means having said shaft bearing means mounted therein,

(b) support arm means connected to said plate means and extending transverse to the axis of said shaft bearing means, and

(c) means for connecting said support arm means to said supporting base comprising;

(i) bracket means substantially encompassing said support arm means adjacent the ends thereof, said bracket means comprising elastomeric material engaging said support arm means, and

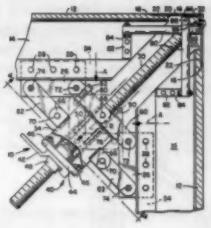
(ii) means for securing said bracket means, said support arm means and said supporting base.

4,447,035

JOINING CONCRETE FORM PANELS TO CAST AN INSIDE CORNER WALL STRUCTURE

H. Grady Ivey, Jacksonville, and D. Leonard Sprouse, Mandarin, both of Fla., assignors to Strickland Systems, Inc., Jacksonville, Fla.

Filed Sep. 30, 1982, Ser. No. 428,855
Int. Cl.³ B28B *7/30*
U.S. Cl. 249—194 **2 Claims**



1. Apparatus for use in casting a concrete inside corner wall structure comprising:

an elongated corner member defining an outwardly facing corner angle to extend lengthwise of the corner to be cast, said member providing outer edges facing generally normal to each other;

a pair of form panels disposed to define outwardly facing surfaces generally perpendicular to each other;

a control unit having a body and actuator means operable to move adjacent edges of said panels into abutment with said outer edges of said corner member preparatory to concrete pouring and to strip both of said form panels and said corner member from the concrete structure after such structure has hardened;

a control element affixed to said corner member and extending inwardly from said member, said control element being engaged with said actuator means; and

four bar linkage means connecting said control unit to both of said form panels, said linkage means including parallel links disposed at opposite sides of said control unit body with each of said links having one end of the link pivotally connected to one of said panels and the other end of the link pivotally connected to said control unit body, said four bar linkage means having retaining means operable when said form panels have been stripped from the concrete structure to retain said linkage means against relative movement while said corner member is stripped by withdrawing force applied to said corner member through said control element,

said retaining means including a retainer movable mounted on one portion of said linkage means and tab means fixedly mounted on another portion of said linkage means, said retainer being moved into retaining engagement with said tab mean when said linkage means is to be retained against relative movement.

4,447,036

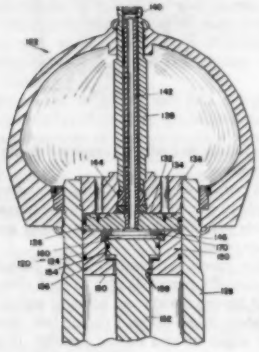
FORCE LIMITING DEVICE FOR AN ACTUATOR ROD

Andrew Hankosky, and Robert L. Clapper, both of Pittsburgh, Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 102,700, Dec. 12, 1979, abandoned.
This application Jun. 25, 1981, Ser. No. 277,430
Int. Cl.³ F16K *31/122*; F01B *15/02*
U.S. Cl. 251—63.4 **11 Claims**

1. In combination, a valve and actuator therefor, said valve being comprised of a body, a closure member mounted within said body for linear movement between valve closed and valve open position, a valve stem connected to said closure member,

cooperating backseating means on said body and said stem adapted for fluid-tight sealing engagement when said closure member is in valve open position to prevent the escape of fluid from the interior of said body, said actuator being comprised of a primary cylinder, a primary piston mounted within said primary cylinder for linear movement from a first position corresponding to valve closed position to a second position corresponding to approximately valve open position, a secondary cylinder movable with said primary piston, a secondary piston mounted within said secondary cylinder for linear movement therein relative to said primary piston between a first limit and a second limit, a piston rod extending from said secondary piston to the exterior of said primary piston, means to connect said piston rod to said stem, means to apply fluid pressure to one side of said primary piston to move it from said



first position to said second position, abutment stop means adapted to arrest movement of said primary piston at said second position whereby the effective thrust of the fluid pressure on said primary piston is absorbed by said stop means when said primary piston is urged against said stop means under the influence of the fluid pressure applied to said one side of said primary piston, means to apply fluid pressure to said secondary piston to urge it away from said first limit to effect sealing engagement of said backseating surfaces when said primary piston is held against said stop means by the fluid pressure applied to said one side of said primary piston whereby the thrust on said piston rod and said backseating means when said primary piston is urged against said stop means is limited to the thrust of the fluid pressure applied to said secondary piston.

4,447,037

WELL BLOWOUT PREVENTER, AND PACKING ELEMENT

Wal J. Huey, Los Angeles; Fernando Murman, Rancho Palos Verdes, and Eugene Matsuda, Laguna Hills, all of Calif., assignors to Hydril Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 277,341, Jun. 25, 1981. This application Jan. 4, 1982, Ser. No. 336,691

Int. Cl.³ B65D *53/00*

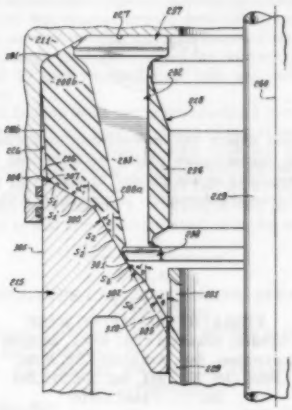
U.S. Cl. 251—1 B **30 Claims**

1. In an annular blowout preventer packer unit having a longitudinal axis, the packer unit adapted to be compressed during axial advancement of a piston in a housing, and to engage surface extent of the housing facing inwardly toward said axis, the combination comprising

(a) said packer unit including metallic inserts generally circularly spaced about said axis, the inserts having webs that extend generally longitudinally, and

(b) said unit including an annulus of elastomeric material extending about said axis and embedding said webs so that the webs anchor the material during displacement thereof, the annulus having a bore,

(c) the annulus having a first body section located to be radially inwardly displaced by the piston during its axial advancement, and a second body section located to be axially compressed by the piston during its advancement so that the second body section remains compressively engaged against said inner surface extent of the housing during said piston advancement, said first and second body sections being integral and in longitudinal alignment prior to said compression of the packer unit by the piston,



(d) said first body section having a first frusto-conical portion of lesser angularity relative to said axis and a second frusto-conical portion of greater angularity relative to said axis, said second portion having greater radial spacing from said axis than said first portion, said portions located radially outwardly of the webs,

(e) the preventer including said piston having at least three interior frusto-conical cam surfaces engageable with said first body section, sequential of said surfaces having different angularites relative to said axis, and sequential of said surfaces being at successively closer spacings from said axis.

4,447,038

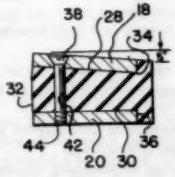
BLOW-OUT PROTECTOR PACKER ELEMENT

Raymond C. Floyd, Spring, Tex., assignor to The Mead Corporation, Dayton, Ohio

Filed Feb. 19, 1982, Ser. No. 350,455

Int. Cl.³ E21B *33/06*

U.S. Cl. 251—1 B **10 Claims**



1. A packing element for a blow-out protector comprising:

a first reinforcing plate,

a second reinforcing plate,

a body of an elastomer interposed between said reinforcing plates,

said plates and said body being formed with semi-cylindrical cutouts on one side thereof which are aligned in said element,

a semi-cylindrical arch formed by said aligned cutouts,

said elastomer facing on said arch being compressed and defining a work surface,

said elastomeric body having upper and lower surfaces respectively interfacing said reinforcing plates, the thickness of said body being greater along said work surface than in the balance of said body such that said surfaces diverge in the direction of said work surface when said body is in a free and uncompressed condition, and

means for holding said reinforcing plates in parallel relationship and thereby compressing said elastomeric body at said work surface such that a preload compression is built into said work surface.

4,447,039

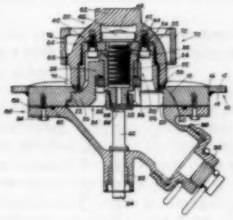
BOTTOM OPERABLE TANK CAR VALVE HAVING EXTERNAL ROTATION STOP

Gunter R. Behle, St. Peters, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Continuation of Ser. No. 215,917, Dec. 12, 1980. This application Jan. 10, 1983, Ser. No. 456,645

Int. Cl.³ F16K *51/00*

U.S. Cl. 251—144 **35 Claims**



1. A tank bottom outlet valve assembly comprising: a tank bottom having a bottom opening therein; a tank mounting flange located within said bottom opening; said mounting flange forming an extension of said tank bottom; fixed stop means mounted upon at least one of said tank bottom and mounting flange, and extending upwardly into said tank; said mounting flange having a flange opening therein; a valve seat separate from said fixed stop means located within said flange opening; a valve closure located within the tank movable vertically relative to said seat, in closed position engaging said valve seat, and in open position being spaced from said valve seat; means for rotating said valve closure located within said flange opening; valve closure stop means on said valve closure located within said tank engagable with said fixed stop means within said tank to prevent rotation of said valve closure and allow vertical movement of said valve closure between open and closed positions.

4,447,040

FLUID LINE COUPLING WITH RELIEF VALVE

Vincent G. Magorien, Granada Hills, Calif., assignor to Systron-Donner, Concord, Calif.

Filed Apr. 20, 1983, Ser. No. 486,695

Int. Cl.³ F16L *37/28*; F16K *31/12*

U.S. Cl. 251—149.8 **7 Claims**

1. A fluid coupling component, comprising:

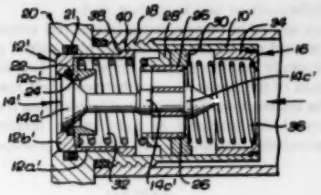
a tubular housing having one end in fluid communication with a fluid system module and an operative end portion for connection to a mating coupling component;

a valve disposed centrally in said housing and movable axially in said housing;

a poppet also movable axially in said housing and having an annular portion engageable with said valve to provide a valve closure;

a valve spring operative to urge said poppet into sealing engagement with said valve;

non-resilient abutment means rigidly connected with said



housing, for limiting movement of said poppet toward the operative end of said housing;

a second spring operative to urge said poppet, and with it said valve, into engagement with said abutment means when in the disconnected condition of the coupling;

whereby, in the disconnected condition, excessive fluid pressure in the component will move said valve out of sealing engagement with said poppet, which is prevented from further movement by said abutment means.

4,447,041

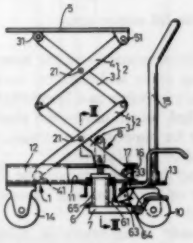
DEVICE FOR LIFTING A TABLE

Hiromu Fujita, Kyoto, Japan, assignor to Osaka Taiyo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 282,645, Jul. 13, 1981, abandoned, which is a continuation of Ser. No. 84,859, Oct. 15, 1979, abandoned. This application Aug. 17, 1983, Ser. No. 523,906

Int. Cl.³ B60P *1/48*

U.S. Cl. 254—9 R **1 Claim**



1. A device for lifting a table comprising:

a frame having an upwardly extending handle bar,

a stretchable assembly of intersecting pivotable arms and shiftable arms pivoted to each other at their intersection, and further stretchable assembly connected to the upper portion of the said stretchable assembly, lower ends of the pivotable arms of the lower stretchable assembly being pivotably attached to the frame and lower ends of the shiftable arms being slidably supported on the frame, the table being mounted on the upper ends of the arms of the upper stretchable assembly,

a hydraulic assembly comprising a piston rod, a piston attached thereto, a cylinder housing the piston for advancing and retracting the piston rod, a pump for feeding working oil to the cylinder operatively associated with the cylinder, an oil tank connected to the pump, a base plate fixedly mounting the cylinder, pump and tank, the base

plate and the cylinder being fixed rigidly to the frame near to the handle bar, the piston rod projecting substantially vertically from the cylinder and having a forward end, the cylinder being surrounded by a case and the oil tank being formed between the cylinder and the case, the pump being coupled to a pedal in order to operate the pump by foot, means for interconnecting said pump to said cylinder, said cylinder to said oil tank, and said oil tank to said pump, said means consisting of oil channels internally formed exclusively in said base plate, and

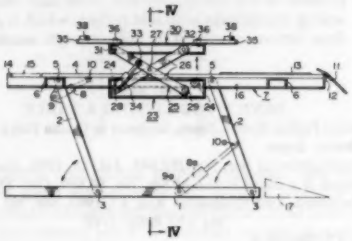
a link assembly comprising a lateral rod connected to the forward end of the piston rod, and a pair of parallel links pivotally connecting both ends of the lateral rod to portions of the pivotable arms between their lower ends and the intersection, the piston rod intersecting the arms of the stretchable assembly at right angles thereto when the stretchable assembly is in a collapsed position.

4,447,042

VEHICLE LIFT

Saburo Masui, Tokyo, Japan, assignor to Yasui Sangyo Co., Ltd., Fujinomiya, Japan

Filed Sep. 9, 1981, Ser. No. 300,681
Claims priority, application Japan, Apr. 6, 1981, 56-51564
Int. Cl.³ B66F 3/22
U.S. Cl. 254—90 **7 Claims**



1. A vehicle lift comprising:

(a) a base;

(b) a platform, mounted on the base, on which a vehicle is driven up upon; said platform having a pair of foot plates which are movable in a horizontal plane;

(c) a first link which moves the platform up and down;

(d) a table for supporting a chassis of the vehicle movably mounted to the platform;

(e) a second link which moves the table up and down independent of the movement of said platform by said first link; and

(f) said table being movably mounted to the platform through a chassis provided with rollers guided by guide grooves in wheel support members, and said chassis is adapted to move forward and rearward along the platform by being suspended from said wheel support members.

4,447,043

AUTOMATIC CABLE STOP FOR TOWING WINCH

Augustino Bocchiaro, 395 Blue Point Rd., Farmingville, N.Y. 11738

Filed Sep. 14, 1982, Ser. No. 417,989
Int. Cl.³ B66D 1/56, 1/48
U.S. Cl. 254—269 **5 Claims**

1. Apparatus for automatically stopping the inward reeling of a tow truck cable by means of a powered winch before the end of the cable is reached to prevent damage to the winch longitudinally extending boom and injury to personnel in the area, comprising:

(a) first rotatable joint means secured to the outward end of the boom,

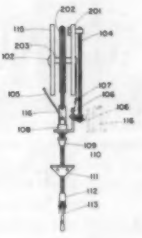
(b) an adjustable link having a first and second end and a longitudinal axis passing through said ends, said adjustable link being connected at its first end to said first rotatable joint means, the adjustable link being adjustable in effective length between its first and second end, and being rotatable about the first rotatable joint means in a generally vertical plane that is parallel to the longitudinal axis of the boom,

(c) a second rotatable joint connected to the second end of the first adjustable link,

(d) a connecting link having a first and second end, the first end being connected to the second rotatable joint for rotation generally in a plane orthogonal to the longitudinal axis of said adjustable link,

(e) a tension adjustment bracket having a first and a second portion, said portions both having a first and a second end, the two portions being positioned generally orthogonal to one another and being rigidly connected together at their first ends, said tension adjustment bracket having a plurality of holes along the length of its first portion between the first portions first and second end, and said tension adjustment bracket being rigidly connected at one of said holes to the second end of the connecting link to orient the first portion of the tension adjustment bracket generally parallel to the adjustable link,

(f) a resilient means connected between an outward end of the boom and one of the holes in the tension adjustment



bracket to draw the tension adjustment bracket towards the boom by rotating the entire apparatus about the first rotational joint means,

(g) a cable guide means for riding on the cable, said cable guide having a first and a second end, a longitudinal axis between the ends and a concave surface in cross section orthogonal to the longitudinal axis, said concave surface encompassing at least a portion of the cable on its side away from the outward end of the boom and said cable guide means being connected at its first end to the second portion of the tension adjustment bracket, to position the longitudinal axis of the guide generally parallel to the longitudinal axis of the adjustable link,

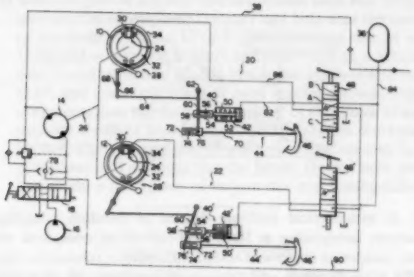
(h) a first switch means connected to the second portion of the tension adjustment bracket, said switch means having a projection for actuating the switch means, said projection extends beyond the cable guide means in a direction away from the boom with its longitudinal axis generally parallel to the longitudinal axis of the cable guide means, and adjacent thereto, said switch means being connected to disconnect power to the winch on being actuated by pressure against the projection along its longitudinal axis, and

(i) a cable extension means secured about the cable at the point it is desired to automatically stop the reeling of the cable, said cable extension means extending radially outward of the cable to engage the switch projection and actuate the switch means as the cable is passed through the cable guide means.

4,447,044
CLUTCHING AND BRAKING CONTROL FOR HYDRAULICALLY DRIVEN CRANE WINCHES

Minoru Nakata, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 26, 1981, Ser. No. 267,356
Claims priority, application Japan, May 26, 1980, 55-69017
Int. Cl.³ B66D 1/14, 5/08, 5/26
U.S. Cl. 254—309 9 Claims



1. A control system for a hydraulically driven crane winch of the type having a drum provided with a hydraulically actuated clutch and a brake, the control system comprising:

(a) a first source and a second source of hydraulic fluid under pressure;

(b) a negative braking mechanism means for automatically actuating a brake, the negative braking mechanism means including a brake cylinder;

(c) hydraulic connecting means including a mode selector valve means movable to at least three positions for selectively delivering the pressurized fluid from said two sources to the clutch and to the brake cylinder in order to condition respectively the winch for a selected one of at least three operating modes consisting of (1) a winching mode wherein said clutch is engaged and said brake is disengaged with respect to said drum, (2) a brake-locking mode and (3) a free-fall mode wherein said clutch and brake are disengaged with respect to said drum; and

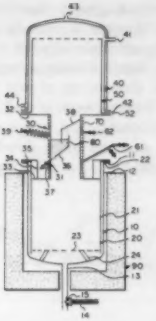
(d) a positive braking mechanism for permitting an operator to selectively apply the brake whenever said mode selector valve means is in that one of the at least three positions which effects operating in the free-fall mode, and the brake is released by the negative braking mechanism.

4,447,045
APPARATUS FOR PREPARING HIGH-MELTING-POINT HIGH-TOUGHNESS METALS

Etsuji Kimura; Katsumi Ogi; Kazusuke Sato, all of Saitama, and Mayuki Hashimoto, Tokyo, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1983, Ser. No. 485,057
Claims priority, application Japan, Jul. 21, 1982, 57-125870; Mar. 4, 1983, 58-34488
Int. Cl.³ C22B 61/02
U.S. Cl. 266—149 8 Claims

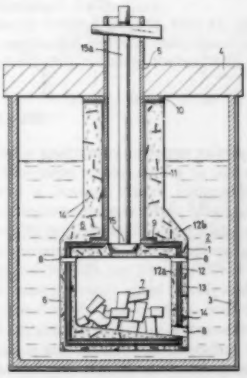
1. An apparatus for the preparation of high-melting-point high-toughness metals by reduction of chlorides thereof with an active metal which comprises a heatable and tightly closable reaction chamber, an evacuable and coolable condensation chamber for condensing the unreacted active metal and the formed chloride vaporized in the reaction chamber to separate these from the formed object metal, and an intermediate connecting section for communicating and sealing off the two chambers, wherein said apparatus comprises a seal pot closing means having a funnel provided in the intermediate connecting section and pot for fusible and vaporizable sealing material which receives the lower pipe of the funnel and the heating means for melting and vaporizing the fusible and vaporizable material, and wherein the pot of the seal pot structure is provided with a conduit with a valve means for the fusible and vaporizable material.



4,447,046
APPARATUS FOR ADDING STRONGLY REACTING MATERIALS INTO A MELT

Günther Beele, Kerpen-Blatzheim, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz AG, Cologne, Fed. Rep. of Germany

Filed Jun. 3, 1981, Ser. No. 269,857
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1980, 3021707
Int. Cl.³ F27D 3/10; C21C 1/10
U.S. Cl. 266—216 5 Claims



1. An apparatus for adding strongly reacting materials to a melt which comprises

a vessel for containing a metal melt, said vessel having an open upper end,

a protective top covering the open upper end of said vessel, said protective covering including a hole therein,

an elongated filling tube sealingly extending through said hole in said protective top from a location outside said vessel to a lowermost end inside said vessel and providing a material passageway therethrough, said filling tube including a support flange extending outwardly of the lowermost end, and

a dip container mounted on said support flange of said filling tube, said dip container including an outer sheath which encloses an internal reactive chamber below the lowermost end of said filling tube and communicable with the

passageway in said elongated filling tube, the outer sheath extending upwardly to surround said filling tube up to a point below said protective top, said outer sheath including at least one passageway therethrough to allow for communication between a melt in said vessel and the strongly reacting materials supplied thereto via said filling tube, said outer sheath having a larger inside dimension than the outside dimensions of said filling tube so as to provide a space therebetween as well as between the outer sheath and the protective top, which space functions as an expansion joint, and said outer sheath being formed of a refractory material having reinforcing materials dispersed therein.

4,447,047

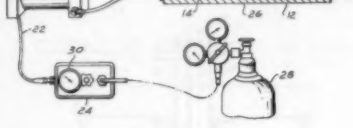
CYLINDER STRUCTURE

James M. Newell, Lowell, Mich., assignor to Di-Dro Systems Inc., Dearborn, Mich.

Continuation of Ser. No. 224,848, Jan. 14, 1981, abandoned. This application Sep. 20, 1982, Ser. No. 419,976

Int. Cl.³ F16F *9/02*

U.S. Cl. 267—118 **6 Claims**



1. Piston and cylinder structure comprising a hollow cylinder having open ends, an annular piston positioned within the cylinder for reciprocation axially thereof, a hollowed out piston rod attached to the piston at one end thereof and having a closed end extending out of the one end of the cylinder, means for sealing against admission of external atmosphere between the piston rod and the one end of the cylinder, the inner surface of the cylinder being slightly greater in diameter than the outer surface of the piston rod whereby the outer surface of the piston rod is in spaced relation to but closely adjacent the inner surface of the cylinder, said piston rod being hollowed out over most of the length thereof, and the hollowed out portion of the piston rod having a substantially greater radial extent than the non-hollowed out remaining portion of the piston rod, means for securing the other end of the cylinder to a source of gaseous actuating medium under pressure to provide the gaseous actuating medium directly to the inside of the piston rod, rigid positive stop means for limiting piston travel under said pressure, means for evacuating the space defined between the cylinder, piston, piston rod and sealing means through the piston rod without contaminating the surfaces defining said space or restricting movement of the piston and piston rod, comprising radial openings in the piston rod extending between the space and the interior of the piston rod, a manifold for gaseous actuating medium connected to the other end of the cylinder, and a control panel connected between the manifold and the source of actuating medium under pressure for providing an indication of the actuating medium as charged.

4,447,048

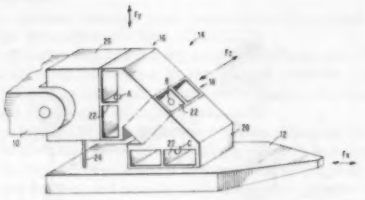
SYMMETRICAL THREE DEGREE OF FREEDOM COMPLIANCE STRUCTURE

Friedrich L. Fischer, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1981, Ser. No. 336,487

Int. Cl.³ F16F *1/36*

U.S. Cl. 267—141.1 **10 Claims**



1. A symmetrical multiple degree of freedom compliant structure, comprising at least two individual compliant elements located at either end of said structure at substantial right angles to each other, said two compliant elements forming a unitary structure such that when a given force is applied the structure will orthogonally resolve the force along two orthogonal coordinates in response thereto, each of said compliant elements comprising two closely spaced planar regions, joined by at least two thin flexible webs which are parallel to each other and substantially perpendicular to the said planar regions with said at least two elements being disposed so that the planes including the planar regions, for each element are perpendicular to each other and the planes including the flexible webs of each element are perpendicular, and wherein each compliant element is constrained to flexural movement along a single axis perpendicular to said flexible webs.

4,447,049

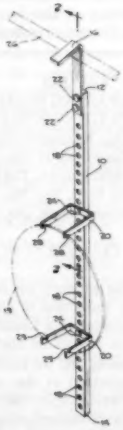
APPARATUS FOR HOLDING A WORK PIECE

Sol Rudy, Upland, Calif., assignor to Alumin-Art Plating Company, Ontario, Calif.

Filed Aug. 2, 1982, Ser. No. 404,561

Int. Cl.³ B25B *11/00*

U.S. Cl. 269—46 **1 Claim**



1. Apparatus for holding a workpiece to be submersed in a liquid bath against jostling and shaking movement, said apparatus comprising:

a main shaft adapted to be vertically disposed having vertically spaced horizontal holes and having top and bottom extremities and a suspension hanger attached to said top extremity;

a pair of U-shaped workpiece holders having legs spread outwardly from the bottom thereof to be adjustably attached to said main shaft, each having a hole near the center of the bottom of the U and at least one hook near the end of each leg of said U formed by making a notch near the end of each leg thereof; and

at least one pair of nut and bolt assemblies, each bolt of such assembly being disposed through said hole near the center of the bottom of the U of a corresponding one of said U-shaped workpiece holders and also through a selected one of said vertically spaced horizontal holes in said main shaft, and each bolt being of such smaller cross-sectional dimension than the diameter of either of said holes so as to provide a swivel movement of said U-shaped workpiece holder; whereby said pair of workpiece holders may be so positioned and oriented that the hooks thereof may grasp and retain a workpiece of unique size and configuration.

4,447,050

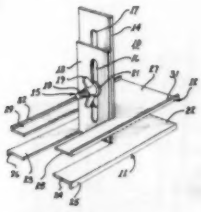
WOOD KERF CHUCK

Charles W. Niemoeller, 1091 Geneva Dr., Prescott, Ariz. 85012

Filed Nov. 9, 1981, Ser. No. 319,549

Int. Cl.³ B25B 5/14

U.S. Cl. 269—49 **1 Claim**



1. The kerf chuck comprising in combination a base jaw having a first base part and two spaced apart first fingers, a vertical kerf member extending from said first base part between said first fingers and adapted to extend through a kerf, a clamp jaw having a second base part and two spaced apart second figures, a vertical holding member extending from said second base part between said second fingers and adapted to be disposed alongside said vertical kerf member, said base jaw including downwardly extending stiffening beads alongside the edges thereof, said clamp jaw including upwardly extending stiffening beads alongside the edges thereof, said vertical kerf member and said vertical holding member each include a longitudinal slot, and screw nut clamp means extending through said longitudinal slots for holding said vertical kerf member and said vertical holding member in their original relative positions.

4,447,051

KITCHEN CHOPPING BOARD

Edwin A. Price, 16001 E. 11th Ave., Aurora, Colo. 80011

Filed Aug. 5, 1981, Ser. No. 290,309

Int. Cl.³ A47J 43/00

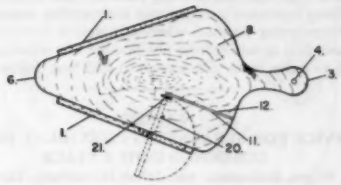
U.S. Cl. 269—302.1 **3 Claims**

1. A foods cutting-chopping board comprising:

a. a flat, substantially triangularly shaped, one piece main body, provided with a handle affixed to, and as part of, the wide rear end portion of said flat, triangular main body member; and wherein

b. the laterally opposed side edges of said body are provided with flanges mounted thereupon, and said flanges vertically project therefrom, above said main body's upwardly useable surface, so as to constitute vertically projecting retaining side barriers; and said flanges are affixed to, and extend in one continuous piece, along substantially the entire length of laterally opposed side edges of said main body, in an unbroken linear tangent and wherein

c. a portion of one of said vertical flanges is cutaway along approximately one-third of its length, said cutaway being



nearest handle end of main body, and with the upper edge of the cutaway portion being coplanar with the main body's upwardly useable surface; and

d. the said cutaway portion has a hinged gate mounted upon the flange's vertical edge, said gate being operable within an arc of 180 degrees, serving as a knife guide plate along the free edge of said gate.

4,447,052

APPARATUS FOR SELECTIVELY TRANSPORTING A STREAM OF PAPER SHEETS OR THE LIKE FROM A FIRST PATH INTO ONE OF SEVERAL ADDITIONAL PATHS

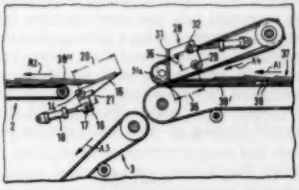
Hans Müller, Zofingen, Switzerland, assignor to Grapha-Holding AG, Hergeswil, Switzerland

Continuation of Ser. No. 196,176, Oct. 14, 1980, abandoned. This application Nov. 12, 1982, Ser. No. 441,227

Claims priority, application Switzerland, Oct. 23, 1979, 477/79

Int. Cl.³ B65H 29/66

U.S. Cl. 271—280 **24 Claims**



1. Apparatus for manipulating streams of articles, particularly streams of partly overlapping sheets, comprising:

(a) a first transporting unit for a stream of articles;

(b) a second transporting unit for the stream defining a gap with said first unit, said first unit having a discharge end adjacent said gap and being operative to advance the stream towards said gap, and said second unit having a receiving end adjacent said gap and being operative to advance the stream away from said gap;

(c) a third transporting unit for the stream having a receiving end adjacent said gap and being operative to advance the stream away from said gap;

(d) a switching device installed in said gap and having a free end which faces said first unit and is movable between a first position in which said device bridges at least a portion of said gap and allows the stream to advance from said first to said second unit and a second position in which said device blocks the advancement of the stream to said

second unit but allows the stream to advance from said first to said third unit;

(e) means for moving said device between said first and second positions;

(f) intercepting means movable to and from an intercepting position in which said intercepting means temporarily prevents the advancement of articles beyond said discharge end; and

(g) actuating means for moving said intercepting means to and from said intercepting position, said actuating means being operative to move said intercepting means into said intercepting position when said device is to move from said first to said second position but not when said device is to move from said second to said first position.

4,447,053

DEVICE FOR SEPARATING INDIVIDUAL SHEETS COMBINED INTO A STACK

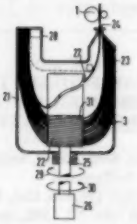
Mats Wager, Sollentuna, and Jakub Hirschberg, Täby, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 3, 1982, Ser. No. 345,242

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1981, 3104670

Int. Cl.³ B65H *3/32*

U.S. Cl. 271—113 **16 Claims**



1. Apparatus for separating individual film sheets in an X-ray installation film changer, said sheets being arranged in a vertical stack laterally disposed one on top of the other in a housing comprising a screw member mounted in said housing for rotation about a vertical axis, said screw member formed with a continuous screw thread having a pitch greater than the thickness of each sheet, and every said sheet always being individually respectively engaged in said screw thread vertically spaced apart from the next adjacent sheet such that rotation of said screw member vertically displaces said sheets simultaneously in said housing and said sheets can not stick together.

4,447,054

SHEET PEELING PAWL

Yasuo Sone, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 18, 1982, Ser. No. 339,936

Claims priority, application Japan, Jan. 23, 1981, 56-8160

Int. Cl.³ B65H *29/54*

U.S. Cl. 271—311 **6 Claims**

1. In an image recording machine of the type wherein a sheet is conveyed along a surface, a sheet peeling pawl for engaging said sheet and peeling said sheet away from said surface, the improvement characterized in that said pawl is comprised of a metal material having a Young's modulus of substantially between $10/10^3$ and 30×10^3 kg/mm^2, said pawl including a mounting portion and a forward portion which is contiguous at one end with said mounting portion and has a front end portion for engaging said sheet at the other end, said mounting portion and forward portion being arcuately formed and said forward portion tapering toward said front end portion.

4,447,055

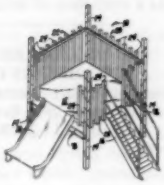
PLAYGROUND EQUIPMENT WITH WOODEN TIMBERS HAVING INTERNAL FASTENERS

Paul W. Ahrens, Grinnell, Iowa, assignor to Miracle Recreation Equipment Company, Grinnell, Iowa

Filed Jul. 14, 1982, Ser. No. 398,071

Int. Cl.³ A63B *9/00*; F16B *23/00*

U.S. Cl. 272—113 **8 Claims**



1. A playground unit having wooden timbers comprising,

a fastener interconnecting a wooden timber to an associated unit member,

said fastener including an internal metal fastener having an internally threaded sleeve element terminating at one end in an enlarged head, said sleeve and head contained within a plastic body having a substantially corresponding shape,

said plastic body including an elongated sleeve element and an enlarged head, said second head having recessed tool engaging means for operating said fastener, and

said fastener being embedded in said wooden member with the outer surface of said enlarged head being substantially coplanar with the adjacent wood member outer surface thereby providing a smooth outer surface on said wood member.

4,447,056

FOOTBALL TRAINING APPARATUS

Tom E. Dalton, Rte. 6, Box 96, Galax, Va. 24333

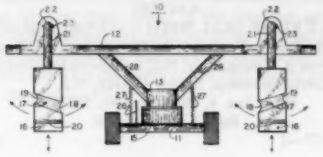
Filed Aug. 26, 1982, Ser. No. 411,897

Int. Cl.³ A63B *67/00*

U.S. Cl. 273—55 R **4 Claims**

1. Blocking apparatus comprising: a frame member, said frame member having wheels positioned thereon, an arm member, said arm member pivotally attached to said frame member, a blocking member having a horizontal axis and a transverse axis, said blocking member attached to said arm member, said

blocking member having an outer surface, said outer surface contoured to form a groove, said groove extending at an angle



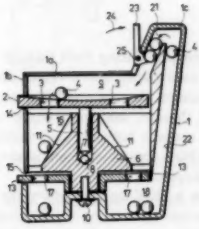
less than 90 degrees to said transverse axis for assisting in blocking exercises.

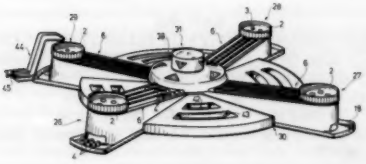
4,447,057

TOY WITH BALLS

Lagos Hollósy, Budapest, Hungary, assignor to Generalimpex Kulkereskedelmi Vallalat, Budapest, Hungary

Filed Dec. 28, 1981, Ser. No. 334,721
Claims priority, application Hungary, Jan. 5, 1981, 11/81
Int. Cl.³ A63F *7/04, 7/02*
U.S. Cl. 273—116 **3 Claims**





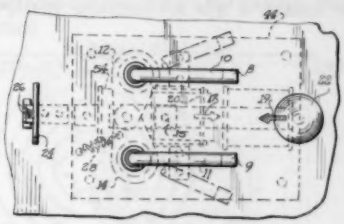
1. Toy with balls and playing field wherein the playing field is formed on at least one rotatable disc **(2)**, where the disc **(2)** is provided with at least one hole **(3)**, the size of which allows falling of the ball freely through, furthermore it is provided with an assorting unit **(6)** connectible with the hole **(3)** of the disc **(2)**, said disc **(2)** is arranged in cup-shaped house **(1)** to be held in the hand, cover **(1a)** and side of which are made of transparent material, furthermore the assorting unit **(6)** is firmly fixed in an assorting chamber **(16)** formed below the disc **(2)** and has as many guiding recesses **(11)** as the number of holes **(3)** of disc **(2)**, the lower end of the guiding recesses **(11)** is connectible through outlets **(17)** of a rotatable null-setting disc **(13)** with a collecting space **(18)**, which is in communication with a preparatory space **(21)** through channel **(22)**, where a feeding key **(23)** is built in between the preparatory space **(21)** and playing space **(9)** above the disc **(2)**.

4,447,058

GAME GATE DEVICE

Roman A. Tojza, Chicago, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.

Filed May 11, 1981, Ser. No. 262,227
Int. Cl.³ A63D *3/00, 3/02*
U.S. Cl. 273—121 A **9 Claims**



1. In a ball-rolling game having a downwardly sloping playfield defining an upper end and a lower end and enabling a game ball to be projected upwardly on the playfield, the combination therewith comprising gating apparatus including a pair of generally L-shaped gate members having first arm portions extending downwardly through said playfield in substantially parallel relation, means supporting said first arm portions for rotational movement about their longitudinal axes, said first arm portions extending above said playfield and being spaced apart a distance slightly greater than the diameter of a game ball so as to define a game ball passage therebetween, said gate members having generally coplanar second arm portions disposed above said playfield in substantially parallel spaced relation thereto and being directed generally toward the lower end of the playfield, a control link fixedly secured in radial relation to each of said first arm portions below said playfield, a pair of discrete control arms each of which is pivotally connected directly to a corresponding one of said control links, an actuator shaft supported below said playfield so that the axis of said shaft is substantially normal to a plane containing the axes of said first arm portions of said gate members, means pivotally connecting each of said control arms to said actuator shaft so as to define a common pivot axis therebetween, and actuator means operatively associated with said actuator shaft for effecting selective rectilinear movement thereof between first and second positions in response to command signals so as to effect selective rotation of said second arm portions of said gate members between first substantially parallel positions defining a generally parallel walled ball guide path therebetween and second diverging positions defining a converging guide path toward said game ball passage, whereby the difficulty of projecting a game ball through said game ball passage from the lower end of said playfield is increased when said second arm portions are in their said first positions.

4,447,059

PUTTING PRACTICE DEVICE WITH SPIRAL TRACK

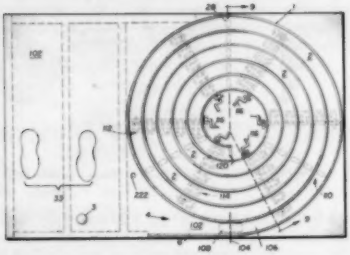
Norman Czajkowski, 8815 Walnut Hill Rd., Chevy Chase, Md. 20015

Filed Aug. 28, 1981, Ser. No. 297,421
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—176 FA **32 Claims**

1. An apparatus for practicing golf putting strokes that provides a direct correlation between the distance that a ball will travel when struck by a player in using the apparatus with respect to a predetermined natural grass putting green said apparatus comprising:

a wall member having front and end portions, and interior and exterior surfaces, and adapted to be positioned upon a synthetic putting surface in an arcuate spiral arrangement about a centrally located vertical axis in such a manner

that said wall member is spirally and successively coiled along a spiral path defined by the top portion of said wall member, said spiral path having a predetermined gradual decrease in radius as measured from said vertical axis as said wall member is coiled from said front portion to said end portion thereby defining a spiral track; said wall member further having a ball receiving portion receiving a ball struck by a player and directing the ball into said spiral track so that the ball will roll along said spiral track and be



in a rolling relationship with said interior surface of said wall; and

a synthetic putting surface having a surface roughness which is so different from the surface roughness of a natural grass golf putting green that a putted golf ball rolling upon said synthetic putting surface will have less velocity loss due to friction than a putted golf ball rolling upon said natural grass putting green whereby a putted ball will roll thereon in said spiral path substantially the same linear distance it would roll on said natural grass putting green.

4,447,060

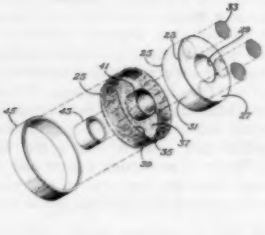
TARGET GAME

Kenneth F. Guinn, 7313 Briley Dr., Fort Worth, Tex. 76118

Filed Nov. 12, 1982, Ser. No. 440,944

Int. Cl.³ A63B *67/06*

U.S. Cl. 273—346 **3 Claims**



1. A projectile member for use in a target game, comprising:

an inner disk having inside and outside faces, a central opening, and a ring-shaped outer periphery, said outside face being provided with a contact engaging material adapted to engage the target;

a cup member having a base with cylindrical sidewalls extending therefrom adapted to receive said inner disk with the ring-shaped outer periphery of said inner disk contacting the interior of said cup member sidewalls, said cup member having a central projection which is adapted to be received within said disk central opening, said cup member base being formed of a complimentary type of contact engaging material for engaging said contact engaging material on said inner disk;

an inner cylinder adapted to be received in said disk central opening over said cup member central projectioa; and

an outer cylinder adapted to be slidingly received over said disk outer periphery and over said cup member cylindrical sidewalls.

4,447,061

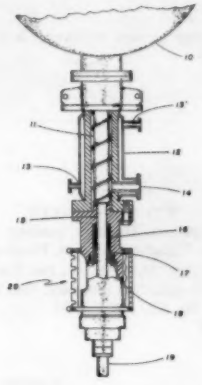
MELT PUMP SEAL WITH VACUUM HOUSING

Richard W. Stover; Frederick T. Proper, both of Chester, Va., and Steven A. Young, Cary, N.C., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 4, 1982, Ser. No. 385,237

Int. Cl.³ F16J *15/40*

U.S. Cl. 277—1 **4 Claims**



1. A method for preventing fluid leakage through a sealing mechanism of a melt pump into a vessel during the period of establishing a vacuum therein and increasing the viscosity of the material fed thereto, said melt pump comprising a shaft which rotates in a space between said sealing mechanism and said vessel and which rotates adjacent said sealing mechanism, comprising the steps of:

a. enclosing in a fluid-tight relationship the area of fluid leakage adjacent the sealing mechanism; and

b. reducing the pressure in the enclosed area sufficiently to prevent the fluid from leaking.

4,447,062

SEALING ARRANGEMENT FOR FLUID FLOW ENGINES

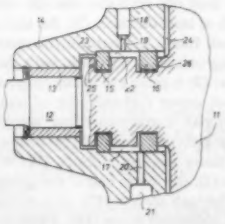
Werner Leicht, Stetten, Fed. Rep. of Germany, assignor to MTU-Motoren-und-Turbinen-Union Friedrichschafen GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Dec. 21, 1982, Ser. No. 451,814

Claims priority, application Fed. Rep. of Germany, May 21, 1982, 3219127

Int. Cl.³ F16J *15/14*

U.S. Cl. 277—3 **7 Claims**



1. A sealing arrangement for fluid flow engines having two seal means arranged adjacent one another, at least one of said

seal means being constructed as piston ring seal, the space formed between the two seal means being operable to be filled with a blocking gas and to be vented by way of vent bore means with adjustable cross section, characterized in that the orifice of the vent bore means in the blocking gas space is operable to be substantially covered off by the piston ring and in that the cross section of the vent bore means effective for the relief of the blocking gas space can be changed by axial movement of the piston ring.

4,447,063

SHAFT SEAL WITH POSITIVELY MAGNETICALLY CONTROLLED SEALING GAP

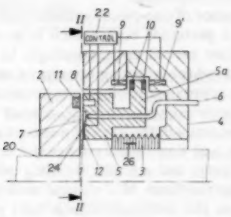
Joachim Kotzur, Oberhausen; Hans H. Reinersmann, Essen; Rolf Albers, Oberhausen; Emil Aschenbruck, Duisburg, and Günter Neuhaus, Oberhausen, all of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nürnberg A.G., Fed. Rep. of Germany

Filed Jun. 1, 1983, Ser. No. 500,160

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1982, 3221380; Jul. 24, 1982, 3227796

Int. Cl.³ F16J *15/54*

U.S. Cl. 277—80 **12 Claims**



1. A seal device for a shaft rotating with respect to a housing, comprising:

a rotating seal ring connected to and co-rotating with the shaft;

a non-rotating seal ring non-rotatably associated with the housing and defining a radial plane sealing gap with said rotating seal ring;

a packing element which is elastically yieldable in all directions, connected between the housing and said non-rotating seal ring for permitting relative motion therebetween to vary a width of the gap and exert a resetting force on said non-rotating seal ring;

sealing fluid means for supplying a sealing fluid to said gap under a supply pressure for exerting a fluid force between said rotating and non-rotating seal rings, said sealing fluid means supplying sealing fluid over at least one supply bore communicating with said gap;

said non-rotating seal ring having a radially extending shoulder with magnetically attractable material connected thereto, the housing having an annular recess for receiving said shoulder;

an electromagnet connected to the housing on each axial side of said shoulder and adjacent said recess for exerting a magnetic force on said shoulder through said magnetically attractable material;

at least one sensor connected to said non-rotating seal ring for sensing a width of said gap; and

control means connected to said at least one sensor and each said electromagnets for activating at least one of said electromagnets in response to said at least one sensor for applying a selected magnetic force to act in conjunction with said fluid force and aid resetting force to maintain a selected width for said gap.

4,447,064

RADIAL SHAFT SEALING RING HAVING A SEALING LIP AND LIQUID DEFLECTORS

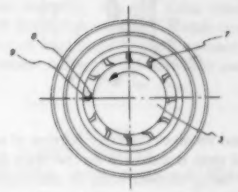
Peter Ehrmann, Hemsbach; Dieter Fuchs, Riedstadt OT-Crumstadt, and Karl-Heinrich Spies, Birkenau, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Aug. 6, 1982, Ser. No. 405,728

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1981, 3147625

Int. Cl.³ F16J *15/32*

U.S. Cl. 277—134 **19 Claims**



1. A radial shaft sealing ring for sealing off a liquid comprising:

a lip ring surrounding said shaft wherein the inner surface of said lip ring facing said sealed off liquid has a conical shape;

a sealing lip fabricated from an elastomer material depending from said lip ring toward said shaft and surrounding said shaft wherein the side of said sealing lip facing said sealed off liquid merges into said conical shaped surface;

means for resiliently pressing said sealing lip against said shaft;

a plurality of liquid deflectors of planar design associated with said lip ring and spaced from said sealing lip on the side of said sealing lip facing said sealed off liquid;

said liquid deflectors being spaced apart around the circumferential periphery of said shaft;

said liquid deflectors having a leading surface facing the direction of rotation of said shaft and extending a distance essentially parallel to the axial direction of said shaft;

said leading surfaces being inclined against the direction of rotation of said shaft;

said liquid deflectors having an inner edge adjacent said shaft with said inner edge being a knife edge-like wiper which merges uniformly into said inclined leading surface; and

said wiper inner edges being spaced from said shaft throughout.

4,447,065

SEALING STRIP

Ronald E. Dupuy, Wabash, and John E. Clark, Marion, both of Ind., assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Feb. 28, 1983, Ser. No. 470,424

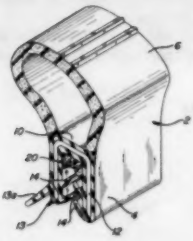
Int. Cl.³ E06B *7/22*; F16J *15/16*

U.S. Cl. 277—184 **3 Claims**

1. A polymeric strip to be mounted on a body flange adjacent a vehicle door opening, including a channel-shaped metal carrier, a relatively hard polymeric covering enclosing said metal carrier, said covering also being channel-shaped and having two relatively hard polymeric legs connected by a relatively hard polymeric base portion, one or more gripping ribs protruding inwardly from the inside facing walls of each of said relatively hard polymeric legs, and a sealing member of relatively soft polymeric material protruding from the inside facing wall of said base portion, wherein the improvement comprises:

said relatively soft polymeric sealing member being of two parts each joined to said base portion and to one of said

legs and having an inwardly facing wall of convex shape extending from said base portion to said leg, said sealing member parts being separated by a slot that extends lengthwise of said strip along the middle of said base



portion and receives the edge portion of said body flange when said strip is mounted on the body flange, with said inwardly facing convex walls of said parts of said sealing member in sealing engagement with opposite sides of said edge portion of said body flange.

4,447,066

SEALING BOOT

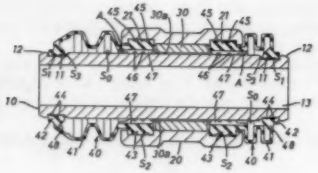
Masayoshi Katagiri, Toyota; Toshio Kondo, Okazaki, and Masanori Midooka, Inazawa, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha; Aisin Seiki Kabushiki Kaisha and Toyoda Gosei, all of Aichi, Japan

Filed Mar. 11, 1983, Ser. No. 474,479

Claims priority, application Japan, Mar. 19, 1982, 57-39940

Int. Cl.³ F16J *15/52*

U.S. Cl. 277—212 FB **9 Claims**



1. In a sealing boot of elastomeric material for hermetically closing an annular opening between cylindrical support and cylindrical movable members positioned to move in a relatively reciprocal relationship, said sealing boot including a bellows portion which is integrally formed at opposite ends thereof with a pair of cylindrical sealing portions attached to said support and movable members, respectively, at least one of the cylindrical sealing portions being formed to have a first end portion and a second end portion interconnected by a cylindrical portion having a cylindrical sealing surface for engaging an annular recess in one of said cylindrical support and movable members the improvement comprising:

said at least one of said cylindrical sealing portions being constructed and arranged such that at least one of said first and second end portions is radially curved away from said cylindrical sealing surface and constructed to effect rotation of said cylindrical sealing portion to cause said cylindrical sealing surface to move into contact with said annular recess.

4,447,067

AUTOMOBILE FENDER PROTECTOR FORMED OF SYNTHETIC RESIN

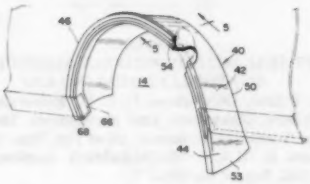
Toshio Yamashita, No. 2914-20, Iiyama, Atsugi City, Japan

Filed Sep. 28, 1981, Ser. No. 306,627

Claims priority, application Japan, Oct. 6, 1980, 55-142464[U]

Int. Cl.³ B62D *25/16*

U.S. Cl. 280—153 R **16 Claims**



1. In a fender construction associated with a fender panel of an automobile for protection against splashing of mud or the like, the fender panel being formed with a generally semicircular wheel-receiving opening,

a combination comprising:

a fender protector of one-piece synthetic resin article, which comprises a protector body which is in the form of an elongate plate curved correspondingly to said generally semicircular wheel-receiving opening of said fender panel and having approximately the same circumferential length as said wheel-receiving opening, a mud guard portion which is generally in the form of a curved plate extending rearwardly and downwardly from the rear end of said protector body, and a fender molding portion which is generally in the form of a vertical wall projecting upwardly from the outboard edge of said projector body over substantially the entire circumferential length of said body, said fender molding portion being formed with a circumferentially extending slot which is generally T-shaped in cross section, said protector body extending inwardly of said fender panel substantially the width of the automobile wheel, means for securing the vertical wall of said fender molding portion to said fender panel and means for securing an inner edge of said protector body to a body member of the automobile; and

an ornamental molding which is generally in the form of an elongate plate so shaped as to fit into said T-shaped slot and is lockably received in said slot,

said fender protector being arranged and constructed so that when said protector is attached to said fender panel so as to make said protector body lie inboard of said wheel-receiving opening and over the wheel, said fender molding portion covers the outboard side of a generally semicircular portion of said fender panel along said wheel-receiving opening.

4,447,068

BICYCLE DRIVE MECHANISM

Le Ester Brooks, 676 San Jose Ave., San Francisco, Calif. 94110

Filed Nov. 19, 1981, Ser. No. 322,869

Int. Cl.³ B62M *9/00;* **F16H** *1/12*

U.S. Cl. 280—260 **11 Claims**

1. In a bicycle including a frame, a crank-and-pedal assembly coupled to a lower portion of the frame, a rear wheel including a rear axle coupled to a rearward portion of the frame, and a drive mechanism coupling the crank-and-pedal assembly to the rear wheel, an improved drive assembly comprising:

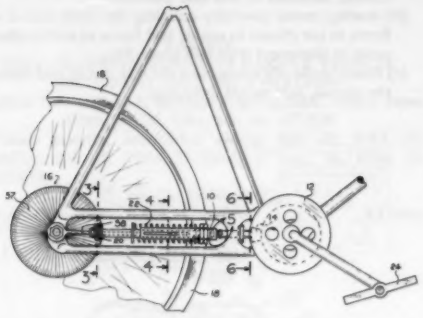
(a) a drive shaft having a forward end and a rearward end;

(b) a front gear means coupling said forward end of said drive shaft to said crank-and-pedal assembly;

(c) a disk gear coupled to said rear wheel, said disk gear

having an outer face provided with a plurality of evenly spaced, inwardly tapering radial grooves;

(d) a torque-shift gear assembly engaged with said drive shaft for mutual rotation therewith, said torque-shift gear



assembly being capable of limited axial movement along said drive shaft while engaging said disk gear; and

(e) means biasing said torque-shift gear assembly towards the center of said disk gear.

4,447,069

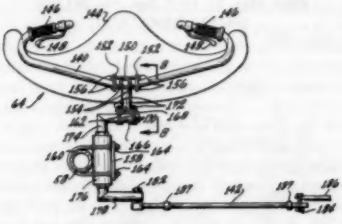
STEERING ASSEMBLY CRASH RESISTANT MOTORCYCLE

Tadeus Winiecki, San Diego, and Thomas F. Tindel, Encinitas, both of Calif., assignors to Henry F. Winiecki and Martha M. Winiecki, both of Vancouver, Wash., part interest to each

Continuation of Ser. No. 143,528, Apr. 24, 1980, abandoned. This application Feb. 1, 1982, Ser. No. 344,283

Int. Cl.³ B62K *21/16*

U.S. Cl. 280—270 **9 Claims**



1. In a motorcycle having two wheels located in tandem, a frame interconnecting said wheels, a steering assembly for steering at least one wheel and a seat assembly for supporting at least one rider, the improvement wherein said steering assembly comprises:

a substantially vertical shaft connected to the front wheel support means to turn said front wheel when said vertical shaft is rotated;

a first crank arm on said shaft;

a tie rod connecting said first crank arm to a second crank arm located to the rear on the motorcycle structure;

said second crank arm mounted on the lower end of a second shaft passing through a bearing attached to said structure;

a third crank arm circular in cross-section mounted on the upper end of said second shaft;

a handlebar assembly mounted on said third crank arm through an excessive force movable mounting means;

said excessive force movable mounting means comprising:

a first tube;

at least one interconnection between one end of said first tube and the side of said third crank arm;

a first flange secured to said one end of said first tube parallel to and spaced from said third crank arm;

two U-bolts each extending from a hole in said first flange, around said third crank arm and back through a second hole in said first flange; and

nuts on the ends of the U-bolts which, when tightened, draw the said one end of said first tube into tight friction contact with the side wall of said third crank arm;

whereby ordinary steering forces against said handlebar assembly will not overcome the gripping force of said tight friction contact between said first tube and said third crank arm and will not cause relative movement between said handlebar assembly and the third crank arm but forces on said handlebar assembly which overcome the gripping force of said tight friction contact will cause relative movement between said first tube and said third crank arm.

4,447,070

FIFTH WHEEL

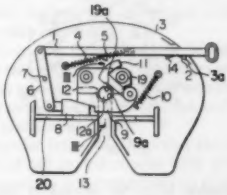
Akira Inoue, Kitakyushu, Japan, assignor to Hitachi Metals, Ltd., Japan

Continuation of Ser. No. 228,183, Jan. 26, 1981, abandoned. This application May 27, 1983, Ser. No. 498,642

Claims priority, application Japan, Oct. 29, 1980, 55-154349[U]

Int. Cl.³ B62D *53/12*

U.S. Cl. 280—434 **14 Claims**



1. A fifth wheel provided on a tractor and adapted to be connected to a generally cylindrical king pin fixed for a trailer, said fifth wheel comprising:

a base plate having a longitudinal slot for receiving the king pin;

a stationary lock rigidly secured to said base plate and having a semi-circular shaped recess straddling said slot and adapted to engage approximately one-half of the circumference of said king pin;

a pivotally mounted lock supported on said base plate for pivotal movement between an opened and closed position, said lock having (i) a main body provided with a semi-circular shaped recess for straddling said slot adjacent said stationary lock, and for engaging approximately the remaining one-half of the circumference of said king pin, when said pivotally mounted lock is in the closed position, (ii) a hook having a curved end, and having a straight end integral with said main body and adapted to contact and be pivoted by said king pin as said king pin enters said slot when said pivotally mounted lock is in the opened position, thereby pivoting said main body toward the closed position, and (iii) means for biasing said pivotally mounted lock toward the opened position;

retainer means including at least one retainer piece slidably mounted on said base plate for releasably engaging said pivotally mounted lock, said retainer piece being adapted to securely hold said pivotally mounted lock in the closed position;

a longitudinal bar having two ends, with one end connected to said retainer piece, and means connected to said bar for biasing said bar so as to cause said retainer piece to engage

said pivotally mounted lock and securely hold it in the closed position;

at least one projection on said bar situated proximately to the other end of said bar for engaging said base plate to thereby securely hold said bar in a first position or a second position, as desired, such that said retainer piece is securely held in the opened or closed position, respectively; and

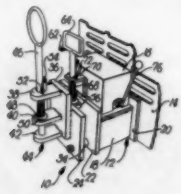
a latch protruding from said bar between said two ends thereof, said bar and latch being positioned, and said latch being adapted, so as to co-act with said curved end of said hook when said pivotally mounted lock pivots from the opened to the closed position to thereby cause said projection on said bar to disengage from said base plate for permitting said retainer piece to slide under the influence of the biasing force exerted by said means connected to said bar and to engage said pivotally mounted lock and hold said lock in the closed position.

4,447,071

EXTENSIBLE HITCH FOR TOWING VEHICLES

James W. Kaplan, Prairie Village, Kans., assignor to Harlan Material Handling Corporation, Kansas City, Kans.

Filed Apr. 19, 1982, Ser. No. 369,487
Int. Cl.³ B60D *1/00*
U.S. Cl. 280—479 R **5 Claims**



1. An extensible hitch for releasably attaching a vehicle having power means for effecting fore and aft movement thereof to a mobile unit to be moved thereby and provided with a coupling, said hitch comprising:

a support adapted for attachment to said vehicle;

a fluid piston and cylinder assembly carried by the support and provided with a reciprocable piston shaft;

a latch adapted for releasable connection with said coupling and secured to said shaft for reciprocation therewith toward and away from said coupling during use of the hitch to attach the unit to the vehicle;

a releasable lock mounted on said support for holding the latch adjacent the support after the latch is connected to the coupling;

a first plate secured to the support; and

a second plate secured to the shaft,

said latch having a spring loaded latching pin on the second plate.

4,447,072

SUSPENSION FOR PIVOTALLY MOUNTING A RIGID AXLE ASSEMBLY

Kirk D. Bradley, Gladstone; Robert R. Koski, Rock, and James W. Clark, Gladstone, all of Mich., assignors to Envirotech Corporation, Salt Lake City, Utah

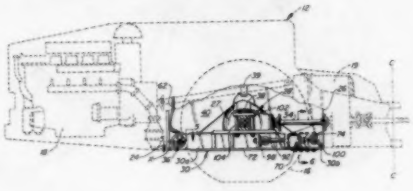
Filed Dec. 14, 1981, Ser. No. 330,545
Int. Cl.³ B60D *7/00*
U.S. Cl. 280—492 **3 Claims**

1. In a vehicle including a chassis with a longitudinal centerline and at least one rigid axle assembly having a central housing portion and axle housings extending from opposite sides thereof, an improved suspension for mounting the axle assembly to the chassis with the axle housings extending transversely of said centerline so that the assembly may oscillate about said centerline comprising:

(a) a axle support frame having opposite front and rear ends, corresponding to the respective front and rear ends of the chassis, mounted to said axle assembly;

(b) bearing means pivotally coupling the front end of said frame to the chassis to enable said frame to swivel about a point in alignment with said centerline;

(c) means resiliently connecting the rear end of said frame to the chassis, said means including;



(i) at least one block-like elastomeric member interposedly connected between the chassis and said frame, said block-like elastomeric member having an elongate cavity extending in longitudinal alignment with said centerline and having sidewalls which resiliently deform and bulge outward to permit said frame to oscillate about said centerline;

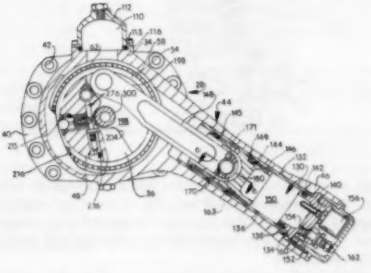
(ii) a pair of spaced-apart vertically-extending flanges fixed to said frame to constrain bulging of said sidewalls of said elastomeric member in directions transverse to the longitudinal axis of the vehicle.

4,447,073

ROAD WHEEL SUSPENSION

Jack M. Brandstadter, Royal Oak, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Mar. 25, 1982, Ser. No. 361,944
Int. Cl.³ B60G *11/26*
U.S. Cl. 280—705 **6 Claims**



1. A self-contained road wheel suspension system comprising in combination: a spindle fixedly secured to a vehicle hull, a road arm having a spindle housing on one end and a road wheel support on the opposite end thereof, bearing means for supporting said spindle housing for rotation relative to said spindle, a fluid filled crankcase defined by said spindle housing and said spindle, a shaft seal retaining said fluid, means defining mechanically operated gas spring means at the opposite end of said road arm including means coupled to said spindle for producing a spring force on the vehicle hull, a mechanically operated fluid controlled damper means remote from said gas spring means and included within said spindle for damping movement of said road arm with respect to said spindle, said damper means constituting the sole damper means in said road

arm for converting energy of motion to heat, and means for absorbing and dissipating said heat without adversely affecting the performance of said gas spring means.

4,447,074

BELT TRANSFER RING FOR PASSIVE VEHICLE OCCUPANT SEAT BELT SYSTEMS

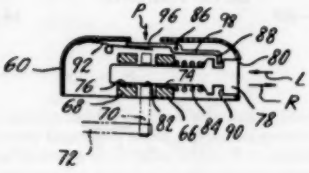
Juichiro Takada, 3-12-1, Shinmachi, Setagayaku, Tokyo, Japan

Filed Jun. 26, 1981, Ser. No. 277,958

Claims priority, application Japan, Jun. 27, 1980, 55-89466[U]; Jul. 15, 1980, 55-98845[U]; Aug. 28, 1980, 55-121255[U]

Int. Cl.³ B60R 21/10

U.S. Cl. 280—804 4 Claims



1. In a passive vehicle occupant seat belt system having a slider that is received for movement along a guide rail and is connected to a drive device that is adapted to move it along the rail between restraint and release positions and a belt transfer ring coupled to the slider and receiving a portion of a restraint belt, the improvement characterized in that the belt transfer ring includes a body having a slot adapted to receive a coupling portion of the slider and a pair of holes, one on either side of the slot, a coupling pin removably received through an opening in one side of the body in a coupling position in which it extends through a hole in the coupling portion of the slider and through one of the holes in the body and into another of the holes in the body, thereby coupling the transfer ring to the slider, and being movable from the coupling position out of the hole in the coupling portion of the slider, in that there is a first spring urging the pin in a direction to move it out of the hole in the coupling portion of the slider, and in that there is a means for releasably retaining the pin in the coupling position, said means being operable from outside the body to enable release of the pin from the coupling position for connecting the transfer ring to and disconnecting it from the slider, the retaining means including a latch member that is shiftable between a position in engagement with the pin to retain it in the coupling position and a position out of engagement with the pin to enable the first spring to shift the pin out of the hole in the coupling portion of the slider to release the transfer ring from the slider.

4,447,075

PRESSURE-SENSITIVE RECORDING MATERIAL

Akio Miyamoto, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 11, 1982, Ser. No. 377,221

Claims priority, application Japan, May 11, 1981, 56-70379

Int. Cl.³ B41M 5/16, 5/22

U.S. Cl. 346—213 14 Claims

1. A pressure-sensitive recording material comprising a base paper having coated thereon microcapsules containing a solution including a benzhydrylsulfone type color former and an amine-hydrophobic alkylene oxide adduct.

4,447,076

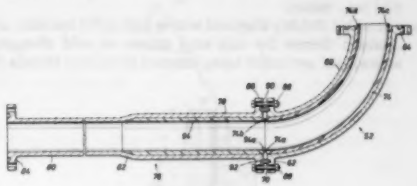
CONDUIT ASSEMBLY

Orde R. Evans, Lafayette, La., assignor to Oreco III, Inc., Lafayette, La.

Continuation-in-part of Ser. No. 85,756, Oct. 17, 1979, abandoned. This application Apr. 22, 1982, Ser. No. 370,626

Int. Cl.³ F16L 9/14

U.S. Cl. 285—55 24 Claims



1. A conduit assembly comprising:

a first conduit section having inner and outer diameters and comprising a first tubular conduit body;

a second conduit section comprising a second tubular conduit body disposed in end-to-end relation with said first conduit body, said conduit bodies having opposed end faces, and a tubular lining disposed within said second conduit body and having an inner diameter substantially equal to the inner diameter of said first conduit section;

annular seal means disposed between said opposed end faces of said conduit bodies, said seal means creating an axial gap between said end faces;

means connecting said conduit bodies in said end-to-end relation with said seal means therebetween and urging said conduit bodies against said seal means with sufficient force to maintain a substantially high pressure seal between said end faces at said seal means;

wherein said tubular lining has a portion extending beyond said end face of said second conduit body across said axial gap and substantially non-compressively abutting said first conduit section;

said seal means being sufficiently rigid to maintain said gap under said force of said connecting means and sized so as to prevent substantial compression of said portion of said tubular lining extending across said gap.

4,447,077

FITTING FOR SMOOTH WALL TUBES

John H. Palmer, Coloma, Mich., assignor to Ramer Test Tools, Inc., Riverside, Mich.

Filed Jul. 13, 1981, Ser. No. 282,434

Int. Cl.³ F16L 33/16

U.S. Cl. 285—104 9 Claims

1. A fitting for mounting to the ends of smooth wall tubes, said fitting being adapted to seal the inside diameter of the tube, and to grip the outside diameter of the tube in the same area so that the counter forces are such as to eliminate tube distortion, said fitting comprising:

a body having an axial bore;

a shaft disposed within said axial bore and having a shaft fluid channel extending axially through it;

a passageway extending through said body and in fluid communication with said shaft fluid channel, whereby fluid from external means coupled to said fitting flows through said passageway into said shaft fluid channel;

piston means slidably disposed about said shaft and within said body said body, piston means and shaft defining a piston chamber therebetween and fluid seals between said body and said piston means and between said piston means and said shaft sealing said chamber;

a fluid channel in said shaft in fluid communication with said shaft fluid channel and said piston chamber;

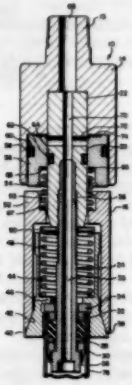
a collet operator slidably disposed about said shaft and posi-

tioned below said piston means to be operatively engagable by said piston means;

spring means disposed between said piston means and said collet operator for normally maintaining a initial separation therebetween;

an elongated screw having one end thereof coupled to said shaft, the other end of said elongated screw being adapted to extend into the end of a smooth wall tube and having stop means thereon and sealing means disposed between said stop means,

a split collet slidably disposed within said collet operator and retained therein by said stop means on said elongated screw, said spit collet being adapted to receive therein the



end of a smooth wall tube, said split collet and said collet operator having complimentary cam surfaces which are operatively engaged to operate said split collet upon operation of said collet operator to grip the outside diameter of said smooth wall tube,

said stop means being slidably fixed on said elongated screw and being urged together by said split collet to compress said sealing means to seal the inside diameter of the smooth wall tube when said split collet is operated by said collet operator,

said collet operator being operated by said piston means when fluid from the external means flows through said passageway into said shaft fluid channel and said piston fluid channel into said piston chamber.

4,447,078

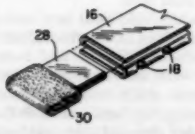
METHOD FOR RETAINING AIR PRESSURE IN A DUCT SYSTEM

James H. Jenkins, 6010 N. 26th St., Arlington, Va. 22207

Filed Mar. 25, 1983, Ser. No. 478,661

Int. Cl.³ F16L *25/00, 55/00*

U.S. Cl. 285—331 **4 Claims**



1. An S slip joint for connecting duct sections of a gas/air conduit system comprising a sheet member bent into three folds to provide two grooves that open in opposite directions and are closed at their remote ends by fold walls which connect the outer folds to the center fold with each of said grooves being adapted to receive one of the edges of connecting duct sections in a slidable association and providing an easily assemblable relation ship between the abutting edges and the slip joint; one of the fold walls connecting the outer folds to the center fold containing apertures along the length thereof to permit fluid communication between the associated groove and the duct section received in the remaining groove when the connecting duct sections are positioned in the S slip joint.

4,447,079

DUCT JOINTING SYSTEM

Michael T. Sullivan, Hamilton, Canada, assignor to Exanno Products Limited, Hamilton, Canada

Division of Ser. No. 81,501, Oct. 3, 1979, Pat. No. 4,288,115.

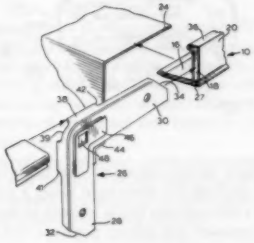
This application Sep. 4, 1981, Ser. No. 299,280

Claims priority, application Canada, Oct. 19, 1978, 313737

The portion of the term of this patent subsequent to Sep. 8, 1998, has been disclaimed.

Int. Cl.³ F16L *23/00*

U.S. Cl. 285—363 **14 Claims**



1. A duct jointing system for joining end-to-end two abutting sections of sheet metal duct, comprising;

a plurality of elongate flange members;

said flange members each having a longitudinal channel portion defining a longitudinal opening for receiving therein one end of a respective wall of a section of said sheet metal duct and a longitudinal hollow portion upstanding from said channel portion;

generally L-shaped corner connection pieces linking said flange members together in mutually angularly disposed relationship to form a frame;

each corner connecting piece comprising a pair of limbs which are engaged in respective ones of said hollow portions and which are connected at a common junction portion, the said common junction portion and at least the portions of the limbs immediately adjacent thereto being provided around their radially outer edges with flange means projecting laterally and rearwardly therefrom for stiffening the respective portions of the piece against bending as two such pieces ae secured together to seal the joint between them; and

cleat means for securing said flange members in side-to-side relationship with like flange members on the abutting section of said duct by engagement of the cleat means over the side-by-side longitudinal hollow portions of the flange members;

each flange member longitudinal hollow portion having a hollow cleat-engaging portion projecting laterally therefrom for engagement by and within said cleat means, the flange means of the respective corner connecting piece being engaged by and within said hollow cleat-engaging portion;

wherein each said connection piece flange means have a cut-away portion at the outer corner of its common junction portion, said cleat means being slidable longitudinally of said side-to-side flange member hollow portions, through said cut-away portions, and into and out of en-

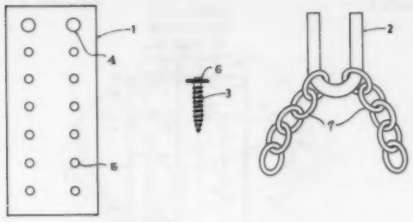
gagement with said laterally projecting hollow cleat-engaging portions.

4,447,080

CHAIN SECURITY DEVICE

Clemens J. Hemmer, 352-G Carlyle East, Belleville, Ill. 62221

Filed Mar. 31, 1980, Ser. No. 123,924
Int. Cl.³ E05C 17/36
U.S. Cl. 292—264 1 Claim



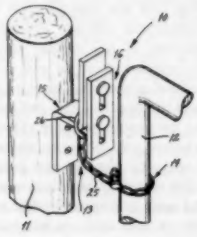
1. A security locking device comprising a plate having a pair of relatively large holes which receive the ends of a U-bar, and series of relatively small holes which each receive a mounting screw securing the plate to a support; at least one chain having its end link secured around the U-bar; the ends of said U-bar closely fitted in said relatively large holes and swaged to attach it to the plate; the head of each screw being flush with and spot-welded to said plate, whereby the device may be used in pairs to be secured together, as by a padlock.

4,447,081

FENCE DOOR LATCH

Phillip D. Stottlemyre, P.O. Box 258, Bolivar, Mo. 65613

Filed Feb. 11, 1982, Ser. No. 347,985
Int. Cl.³ E05C 17/36
U.S. Cl. 292—264 2 Claims



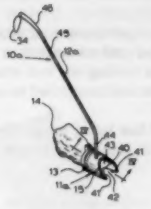
1. A latching assembly for a fence door comprising:
(a) a keeper assembly comprising a first element fastenable to a fence post and a second element secured to the first element and vertically slidable relative thereto; and
(b) a second loop assembly comprising a flexible portion fastenable at one end to a gate and a loop member fastened to the other end and removably attachable to the keeper assembly;
(c) said first element having a leg attachable to a fence post, an uptanding arm having a free end, and an intermediate section connecting and spacing the leg and said arm, said second member being slidable along said arm between an upward position where the loop can be passed over the arm of the first member and the second member and around the lower edge of the second member and a lower position where the second member locks the loop to the keeper assembly.

4,447,082

EXCREMENT CLEAN-UP TOOL AND BAGGER

Donald W. Lindholm, 15368 Betty Ann La., Oak Forest, Ill. 60452

Filed Jul. 30, 1982, Ser. No. 403,486
Int. Cl.³ A47F 13/06; A01B 1/04
U.S. Cl. 294—1 BA 6 Claims



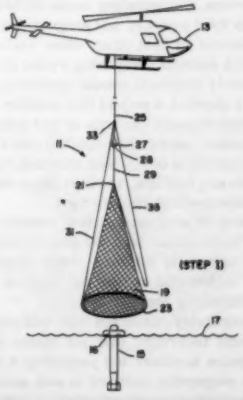
1. An excrement clean-up tool and bagger which comprises a tubular body having a rearwardly inclined open front end providing a bottom scraping lip visible from the top of the body, said scraping lip having a central open front longitudinal groove providing scraping edges along the sides thereof, said body having an upwardly inclined open rear end adapted to receive the mouth of a bag therearound, a releasable clamp adapted to surround the mouth of a bag mounted around the back of the body for securing the bag to the body, an upright handle post extending from the top of the body, a handle on the top end of the post positioned to be grasped by a user for propelling the scraping lip over a surface and under excrement deposited on the surface and to discharge the picked-up excrement into a bag mounted on the back end of the body, and said upwardly inclined rear end holding the bag mouth and clamp above and out of contact with the surface as the scraping lip is propelled on the surface.

4,447,083

NET RECOVERY DEVICE AND METHOD

Jerry M. Campana, and Richard B. Day, both of Bremerton, Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 6, 1982, Ser. No. 395,528
Int. Cl.³ B64D 1/22
U.S. Cl. 294—66 R 15 Claims



1. A net recovery device comprising:

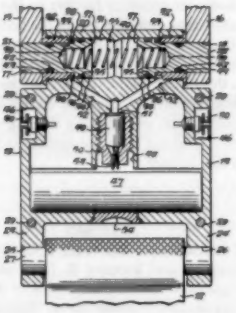
(a) a net having a closed end and an open end, said open end having a periphery;
(b) a rigid member attached to and contiguous with the entire length of said periphery;
(c) a first lift line having one end connected to a releasable hook device;
(d) a second lift line having one end attached to said releasable hook device and the other end connected to said closed end of said net;
(e) a third lift line having one end attached to said first lift line and the other end connected to said rigid member;
(f) a fourth lift line having one end attached to said first lift line and the other end connected to said closed end of said net; and
(g) said fourth lift line being longer than said third lift line, and said third lift line being longer than said second lift line.

4,447,084

EXPLOSIVELY SEPARABLE LINK

Roman Jankowiak, St. Petersburg, and Maurice W. Connell, Naples, both of Fla., assignors to Conax Corporation, Buffalo, N.Y.

Filed Aug. 10, 1981, Ser. No. 291,245
Int. Cl.³ A44B *19/00*; B64D *17/38*
U.S. Cl. 294—83 AE **17 Claims**



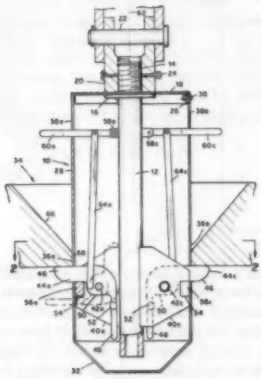
1. In a link connection adapted from automatic disengagement of two connected link members upon the occurrence of a predetermined event, and including means for connecting said link to a strap to form a part of said strap so that said link is a load-bearing element of said strap when loads are applied thereto, a first link member comprising a yoke member having a pair of oppositely disposed, coaxial apertures, one in each arm of said yoke member, a second link member comprising a housing positioned between the arms of said yoke and including a pair of opposed, outwardly extending pins each of which is cooperably received in one of said apertures to permit relative rotation between said link members about the axis of said apertures, the improvement comprising:
(a) said housing in said second link member including a cylindrical bore coaxial with the axis of said apertures;
(b) a pair of oppositely disposed piston members slidably positioned within said cylindrical bore in substantially gastight relationship therewith;
(c) pin means operably connected with said piston members for movement therewith, said pin means being coaxial with said piston members and projecting a sufficient distance to be cooperably received in said apertures; and
(d) means to provide pressurized gas to said piston members to force each piston member inwardly within said bore and thereby withdraw said pin means from said apertures.

4,447,085

GRAPPLE ASSEMBLY

Frederick L. Schmid, San Francisco, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 2, 1982, Ser. No. 384,307
Int. Cl.³ B66C *1/42*
U.S. Cl. 294—97 **7 Claims**



1. A grapple comprising:
an elongate support;
a stop element fixedly connected to said support and spaced from its longitudinal axis, said stop element having first and second abutment surfaces which are spaced apart from each other axially of said support and a side surface which is remote from said support;
a catch having first and second arms disposed in substantially perpendicular relation to each other, said catch being connected at the middle portion thereof to said support for rotation about an axis which is transverse to the longitudinal axis of said support and which is located between said longitudinal axis and said stop element, said catch being swingable between (1) a first object-holding position wherein said first arm abuts said first abutment surface of said stop element and is disposed substantially perpendicular to the longitudinal axis of said support and said second arm is disposed adjacent said support and substantially parallel with its longitudinal axis, and (2) a second object-releasing position wherein said first arm is spaced from said stop element and said second arm is disposed adjacent said second abutment surface of said stop element and substantially perpendicular to the longitudinal axis of said support;
a lever connected at one end thereof to said support for rotation about an axis which is transverse to the longitudinal axis of said support, said lever being spaced from said catch and aligned therewith in a plane including the longitudinal axis of said support, said lever being swingable between (1) a first position wherein it is disposed substantially perpendicular to the longitudinal axis of said support and (2) a second position wherein it is inclined relative to the longitudinal axis of said support; and
a link connected at one end thereof to the first arm of said catch and connected at the other end thereof to said lever so that said catch and said lever jointly move between said first and second positions thereof.

4,447,086

WIND DEFLECTOR FOR SLIDING ROOFS

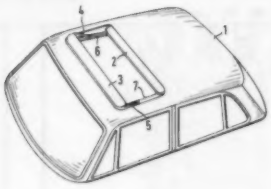
Rudolf Roos, Maintal, and Dieter Federmann, Rodgau, both of Fed. Rep. of Germany, assignors to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 234,290, Feb. 17, 1981, abandoned, which is a continuation of Ser. No. 65,311, Aug. 9, 1979. This application Sep. 7, 1982, Ser. No. 415,006

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1978, 7825737

Int. Cl.³ B60J *7/22*

U.S. Cl. 296—217 **1 Claim**



1. A wind deflector for sliding roofs, especially on automobiles, comprising a wind deflector plate mounted pivotally on the forward roof frame cross-member, two extend arms pivotally attached at the two outer ends of the wind deflector plate, which arms are pivotally journalled on the roof frame longitudinal members, devices acting on the wind deflector plate of the pivoting path length compensation and rod-shaped extend springs provided on each extend arm and effective between the extend arms and the roof frame longitudinal member adjacent to each extend arm for the purpose of pivoting out the extend arms and the wind deflctor plate when the sliding cover is opened and for pivoting in the extend arms and the wind deflector plate by running the sliding cover on to the extend arms when the sliding cover is closed, characterized in that extend springs of circular cross-section are provided, which bear with their free ends slidably with prestress from below against the extend arms, and the other ends of which are fixed to bearing blocks, fixed to the frame longitudinal member, for the extend arms, the extend springs for the purpose of fixing them to the bearing blocks are each bent at their outer ends to a Z-shaped curve and are so inserted into a bore of a first bearing block projection that the outer Z-extension bears from below against the first projection, whereby the extend spring bears from above against a second bearing block projection, which is disposed at a distance from the first bearing block projection, said two bearing block projections are symmetrically disposed with respect to the pivot bearing position for the extend arm situated on the bearing block and are each furnished with a bore for the passage of the extend spring.

4,447,087

TWO-POSITION EASY CHAIR

Henry Massonnet, FR - 01760, Nurieux, France

Filed Jan. 26, 1982, Ser. No. 342,865

Claims priority, application France, Feb. 9, 1981, 81 02621

Int. Cl.³ A47C *13/00*

U.S. Cl. 297—130 **5 Claims**

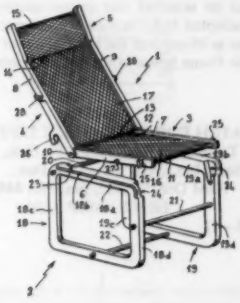
1. A two-position easy chair comprising:

(a) an articulated seat including a seat portion having longitudinal side elements with front and rear ends, and the seat including a backrest portion having longitudinal uprights with upper and lower ends, the respective side elements and uprights being held together by crosspieces, and the seat portion and backrest portion being articulated together at their respective rear and lower ends;

(b) each longitudinal side element of the seat portion having a lateral projection extending from it near its front end, and each of the uprights having a hook near its lower end and having a lateral stop projecting therefrom between the hook and its upper end;

(c) a support comprising two laterally-spaced vertically disposed rectangular frames held together by horizontally disposed front and rear spacers, the frames receiving the seat and backrest portions between them;

(d) each support frame having a horizontal arm joined to a front and a rear leg, each arm having a first downward notch extending partway thereinto in front of and adjacent to said rear leg, and having a second downward notch extending partway thereinto near the front leg, the



front spacer extending between the front legs below the second notches and the rear spacer extending between the rear legs adjacent to the arm; and

(e) the articulate seat being supportable in a raised position wherein the lateral projections of the side elements are fitted into the second notches in the arms of the support frame and the uprights of the backrest are supported by their hooks overlying the rear spacer, and the articulated seat being supportable in a lowered position wherein the side elements are supported on the front spacer and the uprights are supported on their lateral stops fitted into said first notches in the arms.

4,447,088

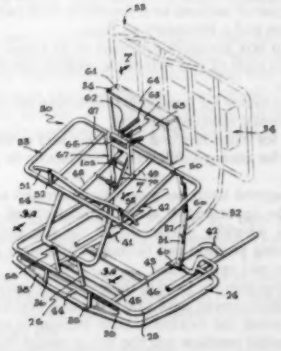
ARTICULATED LUGGAGE CARRIER

Tonko Bodlovic, 206 Ellery Pl., San Pedro, Calif. 90732

Filed Oct. 9, 1981, Ser. No. 310,094

Int. Cl.³ B62J *7/04*

U.S. Cl. 297—217 **9 Claims**



1. An articulated luggage carrier comprising the combination of:

a fixed frame of U-shaped configuration having a pair of

parallel spaced apart leg sections joined at one end by a cross member;

a movable frame of rectangular configuration with respect to said fixed frame in spaced relationship;

link means for selectively positioning said movable frame;

said link means movably interconnected with a selected end of said movable frame to said pair of fixed frame leg sections so that said movable frame is selectively positionable between a first position with respect to said fixed frame and a second position normal to said fixed frame;

resilient means operably carried on said link means for yieldably maintaining said movable frame in either of said first or second positions; and

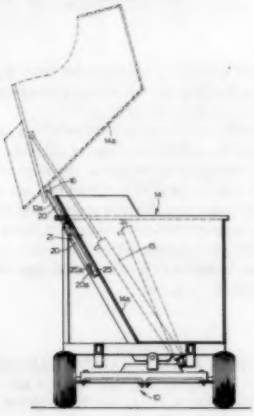
backrest means movably carried on said movable frame adjacent its selected end interconnected with said link means adapted to be moved with respect to said movable frame so as to support the back of a user regardless of said movable frame being in its first or second position.

4,447,089

SAFETY LATCH FOR EXTENSIBLE LIFT MECHANISMS

Sheldon D. Tegtmeier, West Fargo, N. Dak., assignor to Tegtmeier & Sons, Inc., West Fargo, N. Dak.

Filed Dec. 9, 1982, Ser. No. 448,347
Int. Cl.³ B60P 1/34
U.S. Cl. 298—11 **9 Claims**



1. A safety latch for extensible lift mechanisms which includes a pair of inclined strut members, each having an extensible section and a stationary section,

a dump box pivotally mounted at its upper portion to the upper ends of said extensible sections for elevation therewith,

support means for positively positioning the dump box when in normal lowered position,

means for extending and retracting said extensible sections,

means for raising and lowering the box on its pivotal mounting,

an elongated latch bar pivotally connected at its upper end to the upper end of each of said inclined extensible sections whereby gravity urges the bar downwardly into latching position and having an abutment portion spaced from said upper end,

a positive stop lug fixed to the stationary section of said strut for engagement with said abutment portion of said latch bar when the extensible strut element is raised into fully extended position and the box is raised from its lowered position on said support means, thus positively preventing retraction of said strut section as long as the box is raised above its lowered position, and

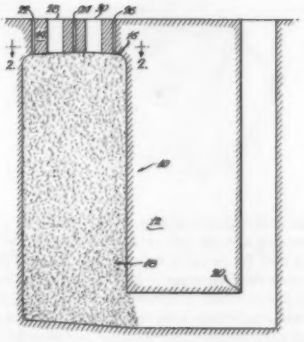
releasing means having a box-engaging portion for engaging the box when the same is in normal lowered position to prevent the abutment portion of the bar from engaging the lug.

4,447,090

PROCESS FOR FORMING AN IN SITU OIL SHALE RETORT

Jay C. Knepper, Denver, Colo., assignor to Standard Oil Company (Indiana) and Gulf Oil Corporation, both of Chicago, Ill.

Filed Jun. 28, 1982, Ser. No. 392,684
Int. Cl.³ E21C 41/10
U.S. Cl. 299—2 **9 Claims**



1. A process for forming an in situ oil shale retort, comprising the steps of:

mining a lateral access tunnel into the bottom of an underground formation of oil shale;

removing from 10% to 40% of said oil shale from said formation to provide an underground cavity defining a void;

conveying said removed oil shale above ground;

drilling a plurality of blast holes extending generally vertically through the top portion of said underground formation;

forming at least two generally upright vent holes extending through the top portion of said underground formation so that the total horizontal cross-sectional area of said vent holes and said blast holes is generally equal to the vertical cross-sectional area of said access tunnel;

setting explosive charges in said blast holes;

detonating said charges to explosively expand said oil shale into a permeable rubblized mass substantially filling said void;

said charges emitting explosive gases upon detonation; and

venting said explosion gases through said vent holes, blast holes and said access tunnel to substantially minimize channeling in said rubblized mass.

4,447,091

CONVERTIBLE WIRE WHEEL HUB COVER

Liem Nguyen, Garden Grove; William J. Segal, Van Nuys, and Kent Friend, Santa Ana, all of Calif., assignors to Orion Industries, Inc., Compton, Calif.

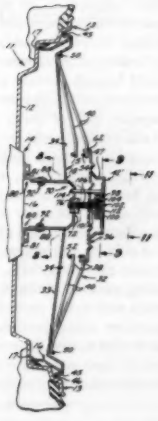
Filed Feb. 23, 1981, Ser. No. 237,251
Int. Cl.³ B60B 7/04
U.S. Cl. 301—37 AT **6 Claims**

1. In the combination of an automotive vehicle wheel having a bolt-on flange and a tire rim, and a wheel cover that includes:

a hub cover in which a central axial opening is defined, and having an interior surface facing said bolt-on flange, an opposite exterior surface, and radially peripheral means for gripping said tire rim, a plate removably mounted in said central opening of said hub cover to bear against the interior surface thereof and having releasable fastening

means thereon; a decorative basket seated upon said exterior surface of said hub cover, a retention ring located externally on said basket to cover the center of said basket and configured to seat thereon, and a non-locking hubcap for removable mounting externally of said retention ring at the center thereof and having fastening means releasably engageable with said fastening means of said plate for securing said hubcap and basket to said hub cover, a conversion kit for providing said wheel cover with a locking mechanism, comprising:

a hub spacer defining a guide and secureable against said bolt-on flange interiorally of said hub cover in the absence of said plate to project axially toward said central opening of said hub cover;



a fastener longitudinally constrained and laterally movable within said guide;

a replacement hubcap for mounting in place of said non-locking hubcap and defining an exteriorally facing central axial recess forming a narrow bearing shoulder and a smaller diameter axial bore;

lockable fastening means seated in said recess against said shoulder and engageable with said fastener in said guide and having a contoured interface surface;

a removable locking key having a tubular body which seats snugly in said recess in engagement with said contoured interface surface of said lockable fastening means for engaging and disengaging said lockable fastening means to and from said fastener in said guide to lock and unlock said replacement hubcap, said retention ring, said basket and said hub cover relative to said hub spacer; and

a cap mountable upon said replacement hubcap to conceal said recess.

4,447,092

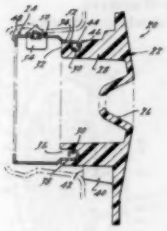
WHEEL TRIM RETENTION

Hans R. Beisch, Amherstburg, Canada, assignor to NI Industries, Inc., Novi, Mich.

Continuation of Ser. No. 114,285, Jan. 22, 1980, abandoned. This application Jan. 26, 1982, Ser. No. 342,781

Int. Cl.³ B60B *7/00*

U.S. Cl. 301—37 P **26 Claims**



1. A wheel trim for a vehicle wheel comprising:

a trim member having means defining a generally axially extending annular flange portion having a generally radially outwardly facing surface positionable in generally radially opposed relationship to the axially extending flange portion of a standard vehicle wheel when said trim member is assembled thereto and a radially outwardly extending portion;

locking means including a generally radially outwardly opening recess formed on said radially outwardly facing surface of said trim member and extending circumferentially thereof, portions of said recess opening axially inwardly at a plurality of circumferentially spaced locations;

a continuous metallic retention band;

means provided on said retention band for cooperating with said locking means to attach said retention band to said trim member in a non-biting assembled relationship;

a plurality of circumferentially extending retaining flanges positioned radially outwardly from said retention band, said retaining flanges being operative to maintain said cooperating means in engagement with said recess;

said retention band including an annular flange portion extending axially inwardly from said cooperating means; and

retention means on said flange portion of said retention band, said retention means being engageable with said vehicle wheel and operative to retain said wheel trim when said wheel trim is installed thereon, said radially outwardly extending portion of said trim member overlying and substantially concealing said retention band.

4,447,093

WHEEL

Joel C. Cunard, and William H. Ziegler, Jr., both of Bedford, Pa., assignors to Brown Group Recreational Products, Inc., Bedford, Pa.

Division of Ser. No. 227,158, Jan. 22, 1981, Pat. No. 4,387,070. This application Aug. 9, 1982, Ser. No. 406,579

Int. Cl.³ B60B *1/06*; B29D *3/00*

U.S. Cl. 301—63 PW **13 Claims**

1. An improved wheel comprising

A. a discoid section

(1) shaped to define a wheel rim, a wheel hub and connections between the rim and hub, and

(2) being composed of a first plastic material having selected physical characteristics,

B. a generally toroidal tire section

(1) encircling the discoid section rim, and

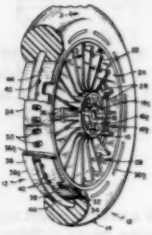
(2) being composed of a second plastic material having at least one physical characteristic different from those of the first plastic material, and

C. means mechanically connecting the tire section to the rim around the circumference of the discoid section, said connecting means including one or more portions

(1) extending appreciably radially beyond the outermost radial extent of said rim into said tire section, and

(2) extending axially to the outer surface of the tire section terminating flush therewith on at least one tire section sidewall at a location spaced radially outward from the periphery of said rim.

8. An improved wheel comprising



A. a discoid section shaped to define a wheel rim, a wheel hub and connections between the rim and hub,

B. a toroidal tire section encircling the discoid section rim, and

C. plastic tire section sidewall decorating means

(1) projecting radially out from the discoid section rim appreciably beyond the outermost radial extent of said rim into the tire section,

(2) having axially extending portions spaced radially outboard of the rim periphery which terminate and define exposed surfaces at the outer surface of the tire section on at least one side of the tire section, and

(3) said decorating means and said tire section being colored differently so that said exposed surfaces of the decorating means appear as contrasting colored indicia at said surface of the tire section.

4,447,094

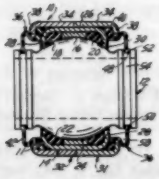
PRELUBRICATED SEALED BEARINGS

William H. Trudeau, Brighton; Donald R. Gaines, and Jon M. Smallegan, both of Farmington Hills, all of Mich., assignors to O & S Manufacturing Company, Whitmore Lake, Mich.

Filed Jul. 24, 1981, Ser. No. 286,471

Int. Cl.³ F16C *32/00*

U.S. Cl. 308—2 R **16 Claims**



1. A hermetically sealed bearing consisting of a sealing unit and a bearing unit in assembly, said bearing unit comprising an inner member, a housing disposed around said inner member, a load-carrying bearing member disposed between said housing and said inner member and defining bearing surfaces between said inner member and said housing, and a substantially radially disposed end flange at an end of said housing, said inner member having a portion projecting from at least said one end of said housing, and said sealing unit comprising a separate shell press-fitted over said bearing unit housing, a substantially radially disposed end flange at an end of said shell, an elastomeric bellows seal having an end flange compressibly retained between said end flange of said shell and said end flange of said bearing housing, a garter flange integrally formed at the other end of said bellows seal, said garter flange forming an opening of a diameter substantially smaller than the diameter of the projecting portion of said inner member for elastically encircling a circumferential area of said projecting portion, and means hermetically sealing the other end of said shell.

4,447,095

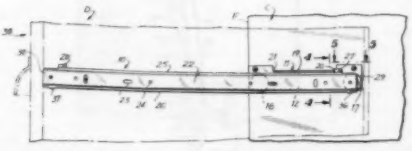
SELF-LEVELING DRAWER SLIDE

Brian S. Fielding, Chappaqua, N.Y., assignor to Hardware Designers, Inc., Mt. Kisco, N.Y.

Filed Jun. 18, 1982, Ser. No. 389,670

Int. Cl.³ A47B *88/00*

U.S. Cl. 308—3.8 **11 Claims**



1. A self-leveling drawer slide assembly comprising a pair of channel members adapted to be mounted to the sides of a drawer and a pair of roller assemblies adapted to be mounted to the drawer-adjacent faces of a cabinet, said channel members being generally U-shaped in transverse section and including a vertically directed branch portion and upper and lower horizontal track portions, said roller assemblies including a horizontally spaced-apart pair of roller members adapted to ride between said track portions and support said upper track for translatory movement between inner and outer limiting positions corresponding, respectively, to the closed and opened positions of said drawer, the horizontal distance between said rollers being generally of the order of about one half or less the length of said track members, said channels including a generally level central portion and at least one end portion inclined upwardly from said central portion, said inclined end portion, in one said limiting position being in registry with at least one said roller of each said roller assembly, said roller assemblies and inclined portions being positioned to coact in said one limiting position bodily to pivot the end of the channel member remote from said at least one end portion in an upward direction, thereby to counteract the tendency of said drawer to sag.

4,447,096

CABINET ASSEMBLY SYSTEM

Ludovic Perl, Chomedey, and Bill Szabo, Montreal, both of Canada, assignors to Herder, N.V., Willemstad, Netherlands Antilles

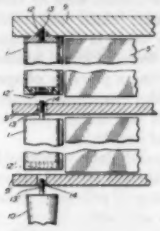
Filed Feb. 16, 1982, Ser. No. 348,978

Int. Cl.³ A47B *43/00*

U.S. Cl. 312—111 **5 Claims**

1. A cabinet assembly system comprising, in combination, at least one vertical support post having a rectangular cross-section, being provided at least on one corner with a pair of narrowly spaced-apart, integrally formed and vertically extending flanges defining a slot; at least one panel having an end edge adapted to be retained between said flanges; at least one horizontal structural member adapted to be secured to said

post, said member including fastening means disposed toward at least one corner thereof; attachment means disposed within the upper end of said vertical support post adapted to matingly engage said fastening means of said horizontal member to



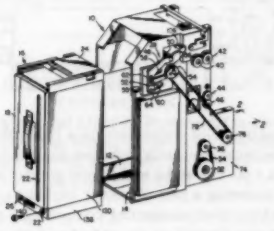
secure said structural member to said post; said panel and one contiguous surface of said post lying in a substantially common plane; said panel being thinner than the width of said post and said structural member having a thickness intermediate the thickness of said panel and the width of said post.

4,447,097

DISPENSER CASSETTE

James O. Lafevers, 3211 Helmet, Irving, Tex. 75060; Richard T. Kushmaul, 705 Woodlawn Ave., Dallas, Tex. 75208, and Ted R. Scott, 1711 Topiea, Euless, Tex. 76039

Filed Aug. 31, 1981, Ser. No. 297,580
Int. Cl.³ E65H *5/00*
U.S. Cl. 312—215 **14 Claims**



1. A cassette for use in a document dispenser, comprising in combination:

a housing for holding a supply of documents, the housing including a loading door having a locking device and further including an unloading door also having a locking device,

means for locking the housing to be secured in the document dispenser while unloading documents therefrom, said means for locking including first and second locks mounted in the housing and a first key mounted in the document dispenser to fit into the first lock, and

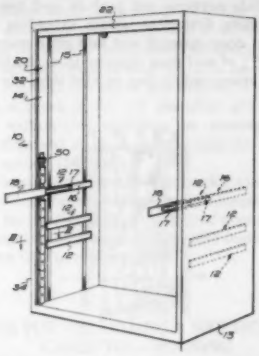
interlock means, including a shaft for interconnecting said first and second locks, responsive to rotation of the second lock to unlock the locking device of the unloading door when the housing is secured in the document dispenser by means of said first key, said interlock means securing the unloading door in a locked position by means of the locking device thereof when the housing is removed from the document dispenser.

4,447,098

PREVENTING TOPPLING OF CABINETS OR OTHER FURNITURE

Ray Parker, Leeds, England, assignor to Thatchcode Limited T/A Flexiform, Great Britain

Filed May 11, 1982, Ser. No. 377,073
Int. Cl.³ E05B *65/46*; E05C *15/04*
U.S. Cl. 312—216 **11 Claims**



1. An article of furniture having a plurality of internal units mounted so as to be slidable out of the article, and a safety device restricting the total number of said units slidable out concurrently yet permitting the sliding out of any chosen one of said units while so restricting the total number, said safety device comprising:

a guide adapted to be positioned on the article so as not to obstruct sliding out of said units, and

a plurality of blocking elements slidably mounted on the guide and projecting from the guide to block the sliding out of said units, the blocking elements being displaceable relative to each other lengthwise along the guide, displacement of at least one blocking element relative to the remining blocking elements creating a gap between successive blocking elements to permit the sliding out of a chosen unit through said gap, the length of said guide available to the blocking elements and the number and total length of said blocking elements thereon being such that said blocking elements occupy less than the total length of the guide available to the blocking elements and leave a remaining free length which is sufficiently great such that when none of said slidable units has been slid out, any blocking elements in the path of any one of the slidable units can be displaced far enough along the guide to create a gap for that unit to be slid out, said free length of the guide being sufficiently limited to restrict the creation of gaps between successive blocking elements and thereby restrict the number of said slidable units which can be slid out concurrently.

4,447,099

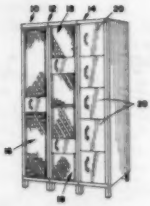
LOCKER CONSTRUCTION

Robert J. French, Wadsworth, and Elmer F. Dorony, Parma, both of Ohio, assignors to Interior Steel Equipment Co., Cleveland, Ohio

Filed Aug. 10, 1981, Ser. No. 291,441
Int. Cl.³ A47B *43/00*
U.S. Cl. 312—257 R **25 Claims**

1. A locker comprising a body portion having back wall means, side wall means, top wall means and bottom wall means, said side wall means and said top and bottom wall means extending forwardly from said back wall means and providing said body portion with an open front, frame means providing a door opening at said front having laterally spaced apart side edges, and a door hingedly connected along one of

said side edges for closing said opening, said door comprising planar open mesh panel means of plastic material and means peripherally bounding said panel means, said means bounding said panel means including laterally spaced apart side portions having upper and lower ends and laterally extending top and bottom portions respectively between said upper and lower ends of said side portions, each said side portion extending along a different one of said side edges of said door opening, each of said side portions and each of said top and bottom portions including first plate means extending laterally inwardly of said door opening and said plate means extending axially inwardly of said door opening from the laterally outer edge of the corresponding one of said side, top and bottom



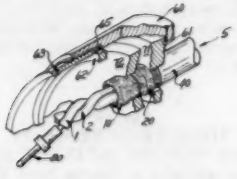
portions, and at least said top and bottom portions being of plastic material formed integral with said open mesh panel means, said side portions of said means bounding said panel means comprising laterally spaced apart metal door frame members having first and second flanges respectively defining said first and second plate means of said side portions, metal cross member means laterally interconnecting said first flanges intermediate said upper and lower ends of said side portions, said first flange of each said door frame member having axially outer and inner sides with respect to said opening, said open mesh panel means being mounted on said inner sides of said first flanges, and said first plate means of said top and bottom portions of said means bounding said panel means having outer surfaces coplanar with said first flanges.

4,447,100

APPARATUS FOR GROUNDING AND TERMINATING A CABLE

John W. Dyce; Edwin R. Waters, both of Sidney, and Cy E. Sherwood, Bainbridge, all of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jun. 1, 1982, Ser. No. 383,889
Int. Cl.³ H01R *4/66, 13/46, 13/58;* **H02G** *15/06*
U.S. Cl. 339—14 R **3 Claims**



1. In combination with an electrical connector of the type having a housing; a plurality of cables extending into said housing, each of said cables having at least one wire therein surrounded by an inner and outer metal shield, an inner jacket of dielectric material between the shields and an outer jacket of dielectric material surrounding the outer shield; means for electrically grounding the inner and outer shield of said cables together and securing said cables within said connector housing; and contacts attached to the end of each wire and mounted within said connector housing, the improvement wherein said means for grounding said cable shields and securing said cables comprises:

a first plate having a plurality of apertures therein with each of said cables extending through a respective aperture;

a plurality of ferrules, each ferrule located around a respective cable and in contact with its outer shield, said inner shield of each cable folded back over its respective inner jacket and outer shield in close proximity to said ferrule, one side of said ferrule located adjacent said first plate;

a second plate having a plurality of apertures therein with each of said cables extending through a respective aperture, one face of said second plate located adjacent the other side of said ferrule; and

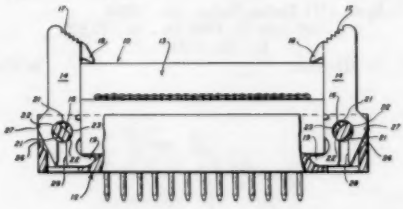
means for securing said plates within said connector housing whereby the ferrules of each of said cables are captivated within the housing to provide a strain relief for an axial force applied to said cable.

4,447,101

CONNECTOR WITH REMOVABLE EJECTOR LATCH

Carmine Gugliotti, Waterbury, Conn., assignor to Litton Systems, Inc., Watertown, Conn.

Filed Apr. 12, 1982, Ser. No. 367,412
Int. Cl.³ H01R *13/635, 13/629*
U.S. Cl. 339—45 M **5 Claims**



1. A locking pivot connection for a removable ejector latch for an electrical connector, wherein the electrical connector comprises a pin cup and a socket, said pin cup having opposite ends for mounting a pair of ejector latches,

said locking pivot connecting comprising a pair of opposed pivot pins located on the end of said pin cup, each pivot pin comprising two opposite flat sides and two opposite curved sides, the thickness of said pivot pin measured between said flat sides being less than the thickness of said pivot pin measured between said curved sides,

said locking pivot connection further comprising a pair of pivot cups located on opposite sides of said ejector latch, said pivot cups being circular and having a diameter slightly larger than the thickness of said pivot pin measured between the curved sides of said pivot pin, and

a pair of entry slots on opposite sides of said ejector latch, said entry slots joining an outer edge of the ejector latch with a pivot cup and defining a neck of material therebetween, said entry slots having a width slightly larger than the thickness of the pivot pin measured between the flat sides of said pivot pin, whereby said ejector latch may slide onto said pivot pins in a direction generally parallel to the plane of the flat sides of said pivot pins and whereby said ejector latch may be locked onto said pivot pins by rotating said latch to skew said entry slots relative to said flat sides.

4,447,102

ELECTRICAL CONNECTOR ASSEMBLIES

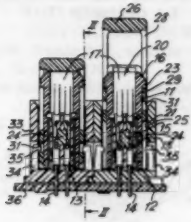
Friedrich J. A. Köurimsky, Bensheim, Fed. Rep. of Germany, and Werner Lothmann, Ascot, England, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 15, 1982, Ser. No. 358,142

Claims priority, application United Kingdom, Mar. 18, 1981, 8108538

Int. Cl.³ H01R *13/62*

U.S. Cl. 339—91 R **6 Claims**



1. An electrical connector assembly comprising male and female connectors with contacts mateable on mating movement of the connectors together and a latching arm mounted on one connector, characterised in that the latching arm (26) is slidably mounted on the one connector (11) and is movable between an extended, release position and a retracted latching position, respectively remote from and adjacent the connectors (11 and 12) when mated, the latching arm (26) and the other connector (12) having complementary latching means (31 and 34) engageable on moving the latching arm (26) to the retracted position, releasably to latch the male and female connectors (11 and 12) together, and the latching means (31 and 34) includes a latching detent (34) extending into the path of movement of the latching arm (26) and depressible to a release condition by engagement with the latching arm (26) on movement of the latching arm (26) between the extended and retracted positions.

4,447,103

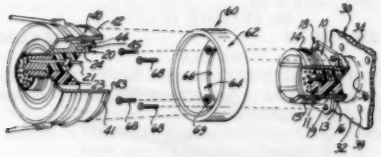
MOISTURE SEAL FOR A SEPARABLE ELECTRICAL CONNECTION

Dee A. Werth, Afton, and Lloyd G. Ratchford, Oneonta, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Dec. 28, 1981, Ser. No. 334,867

Int. Cl.³ H01R *13/52*

U.S. Cl. 339—94 M **6 Claims**



6. A moisture seal for a panel mounted connection of the type including a first electrical connector (10) having a flange portion (18) secured to the panel (30) and a first mating portion (14) extending from the panel, a second electrical connector (20) having a mating portion (24) interconnected with the first mating portion (14); a duality of interconnected electrical contacts (11, 21) carried by said electrical connectors; and means (40, 42, 44, 46, 45, 15) for releasably coupling the connectors, the coupling means comprising a sleeve (42) having a marginal annulus (41) therearound and a transverse end face (43) confronting the flange portion (18), said moisture seal being adapted to seal a region (50) locally around and between the marginal annulus (41) and the flange portion (18), said moisture seal characterized by:

said panel (30) including a front face (32), a back face (34) and a hole (36) extending between the faces, said first electrical connector (10) being secured so as to have its flange portion (18) abutting against the back face (34) and its forward mating portion (14) extending through the hole (36) and terminating fowardly of the front face (32);

a resilient elastomer (60) comprising a tubular section (62) including an annular section (64) connected thereto, the tubular section (62) having an internal diameter (D) slightly less than the sleeve and defining a cavity sized to radially squeeze about the marginal annulus (41), the annular section (64) including an opening (66) slightly smaller than and sized to radially squeeze about the first mating portion (14); and

means for securing the annular section (62) to said panel (30), said securing means comprising a threaded jam-nut (80) sized to threadably engage the second mating portion (14) and compress the annular section (64) downwardly about front face (32) of said panel (30).

4,447,104

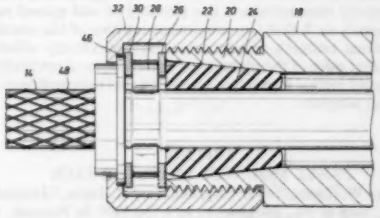
APPARATUS FOR ATTACHING A MULTICONDUCTOR CABLE TO A HOUSING

Samuel E. Haggard, Houston, Tex., assignor to Mark Products, Inc., Houston, Tex.

Filed Jan. 18, 1982, Ser. No. 340,228

Int. Cl.³ H01R *13/58*

U.S. Cl. 339—103 M **5 Claims**



3. Apparatus for attaching a multiconductor cable to a housing, such as the backshell of a connector, comprising a housing having an opening through which the cable extends into the housing, said opening having an inwardly tapering section, a seal member surrounding the cable and wedged in the tapered section of the opening to form a seal between the cable and the housing, a clamp clamped to the cable sufficiently to prevent relative movement between the clamp and the cable, means for transmitting from the clamp to the housing any force urging the cable into the housing, and means attached to the housing for exerting a force on the seal member to compress the seal member between the cable and the tapered section of the opening in the housing and to transmit any forces imposed on the cable to the housing so that the portion of the cable in sealing engagement with the seal member is relieved of such forces.

4,447,105

TERMINAL BRIDGING ADAPTER

William E. Ruehl, Wheeling, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

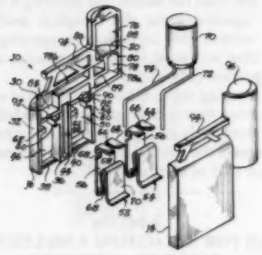
Filed May 10, 1982, Ser. No. 376,862

Int. Cl.³ H01R *3/00, 13/66*

U.S. Cl. 339—113 R **12 Claims**

12. A terminal bridging adapter for mounting at least one electrical component in electrical series circuit between a selected pair of a plurality of spaced rows of substantially

colinear terminals wherein the electrical component has dimensions greater than the space between each of said spaced rows of terminals, said terminal bridging adapter comprising: a housing constructed of insulative material and defining a connector portion including at least two open ended chambers for receiving a like number of terminals therein, said chambers being respectively disposed so as to be positionable in registry with said like number of terminals, a component portion also defined in said housing and including at least one component cavity for receiving said at least one electrical component and offset from said chambers so as to be positionable offset to one



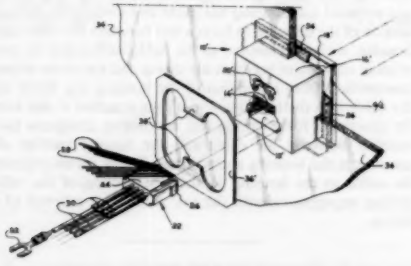
side of said like number of terminals, and a connection cavity defined in said housing and communicating with said at least one component cavity and with said at least two chambers to receive leads of said at least one component therethrough to complete respective electrical circuits to each of said chambers, whereby a plurality of like terminal bridging adapters are respectively mountable to a like plurality of said spaced rows of terminals such that the component cavities of the plurality of terminal bridging adapters may be respectively offset to alternating sides of the plurality of spaced rows of terminals so as to avoid mutual interference between said mounted terminal bridging adapters.

4,447,106

PANEL MOUNTED MODULAR JACK

Timothy W. Houtz, Tower City, and Paul R. Jagen, Mechanicsburg, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 25, 1981, Ser. No. 325,023
Int. Cl.³ H02B *1/02*
U.S. Cl. 339—126 R **2 Claims**



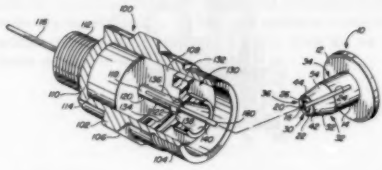
1. In an electrical assembly having a jack and complementary plug mounted on a vertical or horizontal panel, with the jack having a front face of larger size than a rear end, in a hole in the panel sufficiently large to accept the rear end of the jack but insufficiently large to allow the front face of the jack to pass through the hole, the improvement comprising having mounted on the rear end of the jack a lock nut of a flexible metal with an opening sufficiently large to accommodate the rear end of the jack and at least two flexible locking ears protruding into said opening to provide a friction contact with the rear end of the jack and a two-sided sticky tape inserted between the panel and a rear portion of the jack front face.

4,447,107

COLLET FOR CABLE CONNECTOR

Frederick A. Major, Jr., deceased, late of Tempe, Ariz., and by Clare M. Major, personal representative, 175 E. Ellis Dr., Tempe, Ariz. 85282

Filed Mar. 25, 1982, Ser. No. 361,732
Int. Cl.³ H01R *17/18*
U.S. Cl. 339—171 E **2 Claims**



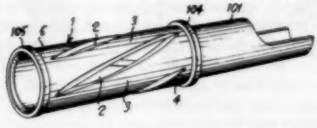
1. Collet apparatus for a coaxial cable connector, comprising, in combination:
- a base flange;
- a column extending downwardly from the base flange;
- a plurality of fingers extending outwardly from the column and comprising a continuation of the column and adapted for gripping a cable to be connected;
- a plurality of axially extending slots disposed between the fingers;
- a bore extending longitudinally of the fingers and defining the interior surfaces of the fingers for gripping the cable;
- a counterbore extending through the flange and the column and communicating with the bore through which the cable extends; and
- conically tapered surfaces on the exterior of the fingers remote from the column defining cam surfaces for camming the fingers radially inwardly to grip the cable, and the column and the fingers between the base flange and the conically tapered cam surfaces are straight and generally cylindrical in configuration.

4,447,108

SOCKET MEMBER FOR AN ELECTRICAL CONNECTOR

Giovanni Ghigliotti, and Attilio Lancella, both of Genova-Sestri, Italy, assignors to Connei S.p.A., Genvoa-Sestri, Italy

Filed Mar. 3, 1982, Ser. No. 354,448
Claims priority, application Italy, Mar. 16, 1981, 12468 A/81; Jun. 26, 1981, 12561 A/81
Int. Cl.³ H01R *13/11*
U.S. Cl. 339—256 RT **10 Claims**



1. A socket member for pin-and-socket electrical connectors, of the type in which the inner areas of the socket member intended to establish the contact with the pin member are, when the said pin member is not inserted, arranged at least substantially in the shape of a hyperboloid of one sheet, said socket member being obtained by means of permanent deformation by twisting, according to a predetermined angle, of a hollow cylindrical body of a suitable metal provided with through slots arranged along its cylindrical surface and inclined with respect to the longitudinal axis of said cylindrical

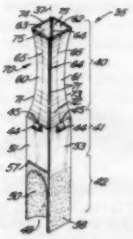
body, said twisting being directed in the sense of inclination of the slots, wherein the improvement resides in the fact that each slot previously to its twisting deformation, presents sides which diverge towards the exterior of said cylindrical body, and said sides meet at the ends of the slot forming curvilinear edges in such a manner that the vertices of said edges located on the inner surface of the socket member are nearer to each other, with respect to the vertices of the edges located on the outer surface, which are farther from each other.

4,447,109

CONNECTOR PIN

Floyd E. Hobart, Jr., Ironia, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jun. 4, 1982, Ser. No. 385,180
Int. Cl.³ H01R *4/02*
U.S. Cl. 339—256 R **10 Claims**



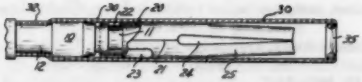
1. A connector pin comprising a unitary piece of electroconductive strip material formed into a longitudinally elongated member having contact and terminal sections at opposite ends thereof and having a mid-section between such two sections with the terminal section extending from the mid-section such that said terminal and mid-sections are in the form of a prismatic tube of polygonal cross section having a plurality of sides which are integrally joined except that two adjacent ones of said sides have therebetween an unbonded longitudinal seam, said contact section comprising a resilient tubular contact projecting outward from the forward part of said mid-section, said terminal section having a solder receiving trough provided as the interior of a depression formed in an imperforate wall portion of said terminal section on a side thereof non-adjacent with said seam so as to have the opening of such depression facing outward from said side, and said wall portion being adapted, by virtue of its being interposed between the outside of said depression's interior and said seam, to provide a barrier for inhibiting liquid material in said trough from reaching said seam and wicking therealong into said contact section.

4,447,110

SOCKET CONTACT FOR AN ELECTRICAL CONNECTOR

Stephen Punako, Bainbridge; Alan L. Davis, Unadilla, both of N.Y., and Raymond J. Eifler, Farmington Hills, Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Apr. 15, 1982, Ser. No. 368,594
Int. Cl.³ H01R *11/22*
U.S. Cl. 339—262 RR **4 Claims**



1. A socket contact for an electrical connector comprising:

a solid contact body having a rear portion including means for receiving a wire, a forward portion having a first annular groove therein and a second annular groove rearwardly of said first groove;

a tubular spring member having an axial slit extending from the rear end to one of the forward end and a slot to allow circumferential compression of said member, said tubular member further including a forward end portion having a plurality of forwardly opening longitudinal slots extending rearwardly from the forward end of said spring to provide a plurality of forwardly extending spring fingers, a rear portion having means for engaging the first groove in said contact body whereby said spring member is secured to said body and a plurality of radially and outwardly extending bosses in the rear portion of said tubular spring member; and

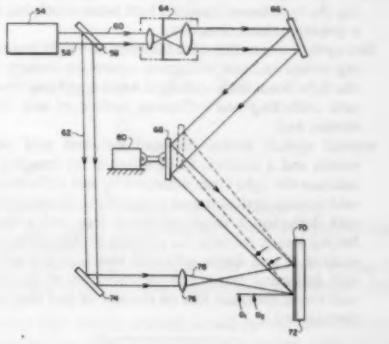
a sleeve telescopically mounted over said tubular spring member, said sleeve including means for engaging the second groove in said contact body whereby said sleeve is secured to said body said sleeve engaging in pressure tight relationship each of the bosses in the rear portion of said spring member.

4,447,111

ACHROMATIC HOLOGRAPHIC ELEMENT

Kenneth G. Leib, Wantagh, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Feb. 25, 1982, Ser. No. 352,362
Int. Cl.³ G02B *5/32*
U.S. Cl. 350—3.7 **10 Claims**



1. The method for fabricating an achromatic holographic optical element for diffracting radiation of wavelengths $\lambda_1 \ldots \lambda_n$ comprising the steps of:

making a first exposure in a three-dimensional photosensitive recording medium of the intersection of a first pair of mutually coherent electromagnetic beams having a wavelength of λ_1, said beams comprising a signal and a reference beam, said beams being incident on said recording medium with said signal beam being incident normal to said medium surface and said reference beam having an angle of incidence θ_1 to said surface normal, said exposure forming a first diffraction means havng periodic structures in said medium;

making further exposures in said recording medium of the intersection of further pairs of mutually coherent electromagnetic beams having a wavelength λ_1, each of said beam pairs comprising a signal and a reference beam, said reference beams of said pairs being incident at an angle, θ_2 through θ_n respectively on said recording medium, said exposures forming further overlapping diffraction means having periodic structures in said medium with the angles $\theta_1 \ldots \theta_n$ being related to one another as the inverse of the ratio of their sines, whereby said optical element diffracts radiation of wavelengths $\lambda_1 \ldots \lambda_n$ through a common

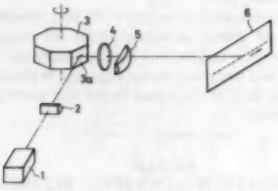
angle such that the general relationship $(\lambda_i/\lambda_j)=(\text{Sin } \theta_j/\text{Sin } \theta_i)$ obtains.

4,447,112

SCANNING OPTICAL SYSTEM HAVING A TILTING CORRECTING FUNCTION

Kazuhiko Matsuoka, and Kazuo Minoura, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1982, Ser. No. 351,455
Claims priority, application Japan, Mar. 3, 1981, 56-30350
Int. Cl.³ G02B *27/17, 3/06*
U.S. Cl. 350—6.5 **8 Claims**



1. A scanning optical system for scanning a medium and having a tilting correcting function, comprising:

means for supplying a light beam;

means having a deflecting and reflecting surface for deflecting the light beam from said light beam supplying means in a predetermined direction;

first optical means disposed between said light beam supplying means and said deflecting means for linearly forming the light beam from said light beam supplying means near said deflecting and reflecting surface of said deflecting means; and

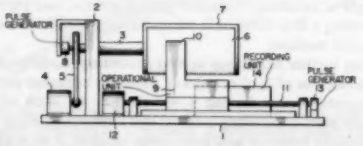
second optical means disposed between said deflecting means and a medium to be scanned for imaging on said medium the light beam deflected by said deflecting means, said second optical means comprising, in succession from said deflector, a single spherical lens and a single lens having a toric surface, the product of the curvature of the surface of said single spherical lens which is adjacent to said deflecting means and the curvature of the surface of said single spherical lens on the side of said medium being zero or less.

4,447,113

SETUP CONDITION RECORDER FOR A COLOR SCANNER

Sadao Ueda, Yasu; Isao Tokura, Uji, and Mitsuhiko Yamada, Kyoto, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Japan

Filed May 22, 1980, Ser. No. 152,472
Claims priority, application Japan, May 29, 1979, 54-65626
Int. Cl.³ H04N *1/46*
U.S. Cl. 358—75 **6 Claims**



1. The method of recording setup conditions for a color scanner, comprising the steps of:

(a) securing to a picture mount means an original picture to be reproduced;

(b) scanning the original picture by incremental areas that are substantially greater than the incremental areas scanned by the color scanner;

(c) determining from the picture signal, setup conditions for a color scanner for reproducing a reproduction picture; and

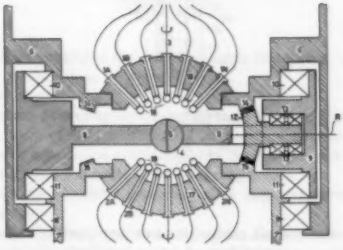
(d) recording the setup conditions on a recording medium.

4,447,114

OPTICAL SLIP RINGS

Johan W. Koene, Borne, Netherlands, assignor to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

PCT No. PCT/NL80/00018, 371 Date Jan. 31, 1981, 102(e) Date Jan. 23, 1981, PCT Pub. No. WO80/02750, PCT Pub. Date Dec. 11, 1980
PCT Filed May 16, 1980, Ser. No. 233,610
Claims priority, application Netherlands, May 31, 1979, 7904279
Int. Cl.³ C02B *7/26*
U.S. Cl. 350—96.2 **6 Claims**



1. A rotary optical coupler comprising:

a. a reflector forming part of an optically transmissive body which is mounted for rotation around a longitudinal axis of the coupler, said reflector comprising two reflective surfaces disposed on opposite sides of a planar cross-section of the body, said cross-section intersecting said axis;

b. a first array of optical conductors mounted for rotation relative to the reflector around said axis, each of said conductors being directed toward a point on said reflector at a predefined angle of incidence;

c. a second corresponding array of optical conductors mounted for rotation relative to the reflector around said axis, each of said conductors being directed toward the same point on said reflector as a respective one of the conductors in the first array and at an angle of reflection corresponding to the angle of incidence for said respective conductor; and

d. means engaging the first and second arrays to effect equal rotation of said arrays as viewed from the reflector, whereby the optical conductors in the first array are constantly coupled to respective ones of the optical conductors in the second array during rotation of the first and second arrays.

4,447,115

MULTIPLE CONNECTION FOR AN UNDERSEA CABLE SYSTEM

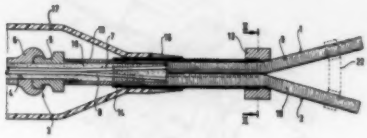
Lucien Guazzo, and Jean-Pierre Trezeguet, both of Calais, France, assignors to Les Cables de Lyon, Clichy, France

Filed May 6, 1982, Ser. No. 375,628
Claims priority, application France, May 7, 1981, 81 09070
Int. Cl.³ H02G *15/14;* G02B *7/26*
U.S. Cl. 350—96.2 **9 Claims**

1. A multiple connection for connection a plurality of armoured cables to the housing of electrical apparatus in an undersea system having a cable interconnection point where a plurality of cables serving different destinations are brought

together, each of said cables comprising a core surrounded by armour and being terminated by a length of bared core extending beyond a severed end of the armour, and said housing having a hollow cable-fixing part through which the bared cable cores pass; said connection comprising:

a steel binding ring through which the armoured portion of each of said cables is threaded, said ring serving to bind said armoured portions of cable together;



a steel tube threaded over said bared cores of said cables, having one end abutting against severed end portions of the armour of said cables and having its other end fixed mechanically to said hollow cable-fixing part of the electrical apparatus housing;

and auxiliary armour wound around the portions of armoured cable bound together by said ring and around the adjacent portion of said steel tube.

4,447,116

CONTROLLABLE ELECTRO-OPTICAL MODULATOR/PHASE SHIFTER USING AN INTEGRATED OPTICAL INTERFEROMETER

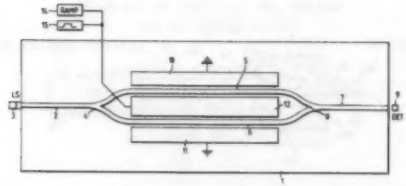
George D. H. King, Walden, and Michael C. Bone, Harlow, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 7, 1982, Ser. No. 366,171

Claims priority, application United Kingdom, Apr. 9, 1981, 8111096

Int. Cl.³ G02B 5/172

U.S. Cl. 350—96.13 **4 Claims**



1. An optical waveguide interferometer arrangement including:

an optical waveguide for transmitting single-mode optical energy;

first and second single-mode optical waveguide branches defined by regions of increased refractive index in an electro-optically responsive substrate, which branches diverge from a common connection to said waveguide and reconverge to a further common connection to a further single-mode optical waveguide, said two branches forming first and second single-mode light paths of substantially identical optical length;

conductive electrodes disposed adjacent to a portion of at least one of said single-mode optical branches between its points of divergence and reconvergence;

a first source of electrical energy from which a waveform of symmetrical ramp shape is applied to said electrodes so as to differentially and cyclically vary the optical properties of the two branches, thus causing optical wave interferences at said reconvergence which are periodically constructive and destructive so that the light from said reconvergence is intensity modulated with a sinusoidal waveform at a frequency which can be a multiple of that of the ramp waveform; said ramp waveform being adjusted in amplitude to give an integral number of half periods of the output modulation waveform, a DC bias being provided to obtain a discontinuity free output waveform; and

a second source of electrical energy from which a waveform of rectangular shape is applied to said electrodes, the rectangular waveform having alternate ones of its half cycles in phase with one slope of the ramp and with the other slope of the ramp respectively, so that each said rectangular half-wave reinforces the said slope of the ramp waveform, the amplitude of said rectangular waveform being adjustable to provide for phase shift of the output signal while maintaining a discontinuity free waveform of the output signal leaving the point of reconvergence.

4,447,117

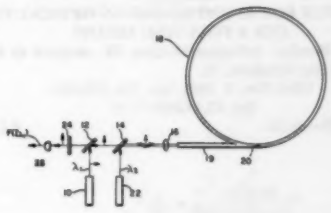
GATED FIBER OPTIC TRANSMISSION

Lloyd C. Bobb, Willow Grove, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 6, 1982, Ser. No. 395,557

Int. Cl.³ G02B 5/14

U.S. Cl. 350—96.15 **9 Claims**



1. A gated fiber optic sensor system, comprising:

a first light source for generating a pulse of light having a first optical wavelength;

optical fiber means coupled to said first light source for propagating the first light pulse in a continuous cyclic path;

a second light source coupled to said optical fiber means for generating a pulse of light having a second optical wavelength; and

semiconductor means affixed to said optical fiber means for gating the propagation of the first light pulse with the second light pulse so that the first light pulse is extracted from the continuous cyclic path.

4,447,118

OPTICAL INFORMATION TRANSFER SYSTEM

Owen R. Mulkey, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

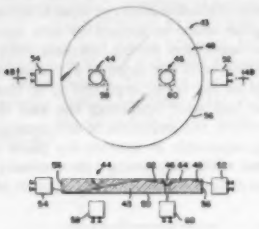
Filed Sep. 21, 1981, Ser. No. 303,793

Int. Cl.³ G02B 5/14

U.S. Cl. 350—96.16 **22 Claims**

8. A system for transferring information via light signals, comprising: a light-conductor of light transparent material having an edge surface forming a peripheral boundary thereof, a first major surface and a second major surface substantially parallel to said first major surface, said second major surface having multiple indentation means formed therein, each indentation means being defined by a light reflecting conical surface with its central axis normal to said second major surface and its apex opposite said first major surface; a first plurality of stations positioned adjacent to said edge surface; a second plurality of stations positioned adjacent to said first major surface

and each station in said second plurality being positioned opposite the apex of a corresponding indentation means; one plurality of stations including means for providing light signals and the other plurality of stations including means for receiving



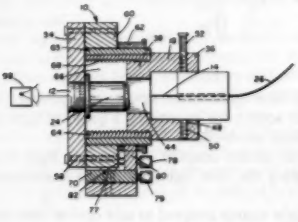
light signals, whereby light signals from said one plurality of stations are optically coupled into said light-conductor and a portion of such light signals is intercepted by at least one conical surface and is reflected to at least one of said other plurality of stations.

4,447,119

APPARATUS FOR MAINTAINING AN OPTICAL FIBER AND A FOCUSING MEANS

J. Donald Beasley, Arlington Heights, Ill., assignor to Gould, Inc., Rolling Meadows, Ill.

Filed Nov. 2, 1981, Ser. No. 316,991
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.18 **9 Claims**



1. A multi-movement optical fiber and lens positioner device for impinging light from a light source through the lens into a core of the optical fiber, comprising in combination:

maintaining means for maintaining an optical focusing lens and one end of an optical fiber in a precisely controlled relationship, said maintaining means including a gimbal means for adjusting said precisely controlled relationship by advancing or retracting said end of said optical fiber with respect to said lens; and

means for pivoting said maintaining means to vary impingement of light onto the lens.

4,447,120

FIBER OPTIC CABLE CLAMP

Leslie M. Borsuk, Los Alamitos, Calif., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Oct. 5, 1981, Ser. No. 308,518
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 **15 Claims**

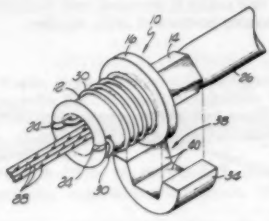
5. A fiber optic cable clamp assembly comprising:

a fiber optic cable having a strength member and an optical fiber;

inner and outer sleeves, said inner sleeve terminating in a front edge;

an axially extending slot in said inner sleeve opening at said front edge;

said cable extending forwardly through said inner sleeve with its strength member extending outwardly through



said slot and rearwardly in helical form around said inner sleeve; and

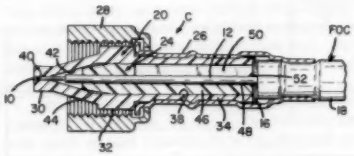
said outer sleeve being crimped around said helically wound portion of said strength member and said inner sleeve to tightly secure said strength member to said inner sleeve.

4,447,121

CONNECTOR FOR FIBER OPTIC MEMBER

Ronald F. Cooper, Orrtanna, and Erlon F. Johnson, Elizabethtown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 6, 1981, Ser. No. 319,025
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 **20 Claims**



1. A connector for terminating a fiber optic member having a buffer material thereon comprising a ferrule having an opening extending therethrough including front and rear bores interconnected by a conical surface characterized in that:

an insert comprises a conical section and a cylindrical section, a hole through said conical section and said cylindrical section to enable the fiber optic member to be inserted therethrough with an end of the fiber optic member being exposed, said cylindrical section having a longitudinally extending slot communicating with said hole which forms arcuate members,

said insert being positionable on the buffer material and being insertable along with the fiber optic member into said opening with said conical section engaging at least a part of said conical surface and with said cylindrical section extending along said rear bore,

a crimping ring on said ferrule over said slot and adapted to be controllably crimped thereon to move said arcuate members thereunder into mechanical engagement with the buffer material to secure said fiber optic member within said ferrule with the exposed end of the fiber optic member disposed in the front bore.

4,447,122

PLASTIC SHEATHED CABLES

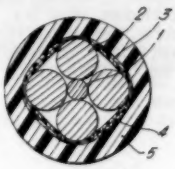
Ralph Sutehall, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jul. 1, 1982, Ser. No. 394,372

Claims priority, application United Kingdom, Jul. 23, 1981, 8122710

Int. Cl.³ H01B 7/02

U.S. Cl. 350—96.23 7 Claims



1. A cable comprising:

a conductor; and

an outer sheath of a relatively low flammability material having incorporated therein means for substantially reducing dripping of said sheath when subjected to a flame, consisting essentially of the following constituents in the proportions by weight:

polyester elastomer	100 parts
flame retardant additive	20 parts
titanium dioxide	from 13.3 to 80 parts

4,447,123

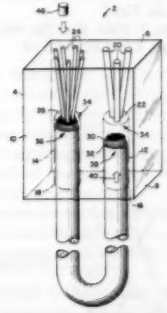
FIBER OPTIC SECURITY SYSTEM INCLUDING A FIBER OPTIC SEAL AND AN ELECTRONIC VERIFIER

Edward A. Page, Adelphi, Md., and Carl R. Babel, Annandale, Va., assignors to Ensco Inc., Springfield, Va.

Filed Jul. 29, 1981, Ser. No. 288,042

Int. Cl.³ G02B 5/16

U.S. Cl. 350—96.24 31 Claims



24. A fiber optic security seal system for the detection of tampering with a sealed enclosure, said fiber optic security seal system comprising

a fiber optic cable for conducting light, said fiber optic cable including a first end which may be illuminated by a light source and a second end which emits light in response to the illumination of said first end,

fiber optic seal body means for receiving said first and second ends of said fiber optic cable, said fiber optic seal body means also having a first light guide means connected between the exterior surface of said fiber optic seal body and said first cable end for transmitting light from the light source to the first end of said fiber optic cable and a second light guide means connected between said exterior surface of said fiber optic seal body and said second cable end for transmitting light emitted by the second end of said fiber optic cable, and

an electronic verifier means for deriving a seal signature, said electronic verifier means including at least one light source means for illuminating said first end of said fiber optic cable, said light source means including a light injection guide means for registry with said first light guide means at said external surface of said fiber optic seal body to inject light from said light source means into said first light guide means,

at least one light detecting means for generating an output signal in response to light emitted from said second end of said cable, said light detecting means including a verfier guide means for registry with said second light guide means at said external surface of said fiber optic seal body to direct light from said second light guide means into said light detecting means, and

electronic circuit means connected to both said light source means and said light detecting means for controlling the injection of light into said first light guide means and for processing said output signal from said light detecting means to derive a seal signature representation indicative of the intensity of light directed into said light detecting means from said second light guide means.

4,447,124

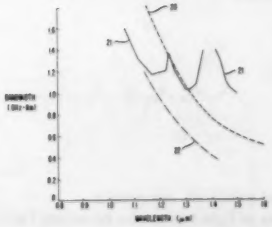
MULTIMODE OPTICAL FIBER WITH RADIALLY VARYING ATTENUATION CENTER DENSITY

Leonard G. Cohen, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 27, 1981, Ser. No. 315,440

Int. Cl.³ G02B 5/172

U.S. Cl. 350—96.30 13 Claims

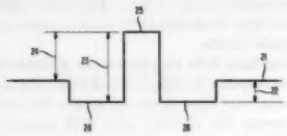


1. Multimode optical fiber for transmitting signals at least at a first wavelength, the fiber comprising a core and a clad and having a loss at the first wavelength of at least about 0.8 db/km, with a loss of at least about 0.3 db/km being caused by the presence of attenuation centers in the core, characterized in that the core has a radially varying attenuation center concentration profile in at least part of the fiber, with the maximum concentration exceeding the minimum concentration by at least about 10%.

4,447,125
LOW DISPENSION SINGLE MODE FIBER

Paul D. Lazay, New Providence; Paul J. Lemaire, Basking Ridge, and Arthur D. Pearson, Bernardsville, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 271,957, Jun. 9, 1981. This application Apr. 1, 1982, Ser. No. 364,623
Int. Cl.³ G02B *5/172*
U.S. Cl. 350—96.30 **2 Claims**



1. A single mode fiber comprising a substrate tube and within said substrate tube:

(a) an up-doped core which contributes a refractive index increase relative to that part of the fiber originating in said substrate tube of less than 0.40 percent and greater than 0.30 percent,

(b) a down-doped cladding with no abrupt change in index of refraction which contributes a refractive index decrease relative to that part of the fiber originating in said substrate tube of less than 0.22 percent and greater than 0.15 percent,

(c) a core diameter of between 8.7 and 7.5 microns and,

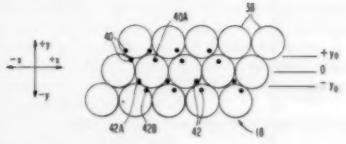
(d) a ratio of diameter of the down-doped cladding to the diameter of the up-doped core of greater than 5.5, the cutoff wavelength being less than 1.31 μm,

the Δ of the fiber being greater than 0.3 percent and less than 0.75 percent, the dispersion of the fiber being less than 5 psec/nm-km within the wavelength range of 1.25–1.385 μm.

4,447,126
UNIFORMLY INTENSE IMAGING BY CLOSE-PACKED LENS ARRAY

Paul F. Heidrich, Tucson, Ariz.; Robert A. Laff, Yorktown Heights, and Thomas B. Light, Chappaqua, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 2, 1982, Ser. No. 394,976
Int. Cl.³ G02B *5/14*; G03B *27/00*
U.S. Cl. 350—96.31 **10 Claims**



1. An optical printhead, comprising:

a linear array of light sources for providing light outputs to an imaging system,

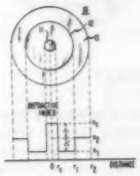
an imaging system, including a hexagonal close-packed lens array having at least three rows of lenses therein, said lens array having at least two lines of greatest transmission symmetry where said lines of greatest symmetry are lines of minimum deviation of transmission of optical radiation therethrough, and

wherein said linear array of light sources is substantially parallel to and aligned with respect to one of said lines of greatest symmetry such that transmission of said radiation through said lens array is with minimum deviation of transmission.

4,447,127
LOW LOSS SINGLE MODE FIBER

Leonard G. Cohen; Wanda L. Mammel, both of Holmdel, and Dietrich Marcuse, Lincroft, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 9, 1982, Ser. No. 367,094
Int. Cl.³ G02B *5/172*
U.S. Cl. 350—96.33 **4 Claims**



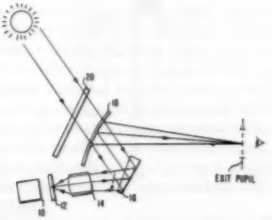
1. A single mode fiber comprising:

an inner core region having a refractive index n_c and a radius r_c surrounded by a first, inner cladding having a refractive index n_1 and an outer radius r_1, and a second, outer cladding having a refractive index n_2, where $n_1 < n_2 < n_c$; and the ratio $r_1:r_c$ is at least 6.5:1.

4,447,128
DIFFRACTION HEAD UP DISPLAY SOLAR RADIATION FILTER

John J. Ferrer, Los Angeles, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Dec. 3, 1982, Ser. No. 446,538
Int. Cl.³ G02B *27/14*
U.S. Cl. 350—174 **12 Claims**



1. A visible light filter for a head up display which includes a display means for producing an image of display information and an optical system including lens means for directing the image of the display information to the eye of a viewer comprising:

optical filter means positioned between the display means and the lens means which is reversibly responsive to focused visible light directed through the lens means back toward the display means to block the focused visible light

and which is transmissive to the display information except at the localized portion where focused visible light is blocked.

4,447,129

PERISCOPIC INSTALLATIONS WITH MULTI SIGHTING HEADS FOR SUBMARINES

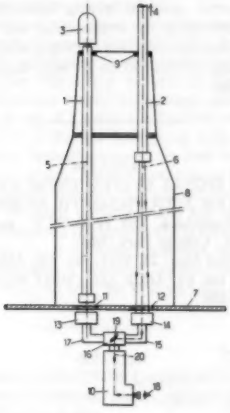
Rene Barthelat, Taverny, and Alain Dore, Conflans Saint Honorine, both of France, assignors to Societe d'Applications Generales d'Electricite et de Mechanique Sagem, Paris, France

Filed May 10, 1982, Ser. No. 376,767

Claims priority, application France, May 15, 1981, 81 09773

Int. Cl.³ G02B *23/08, 23/22*

U.S. Cl. 350—302 **7 Claims**



1. A periscopic installation with multi sighting heads for submarines, characterized in that it comprises:

at least two axially and rotatably mobile masts carrying respectively sighting heads at their upper end, these masts and respective sighting heads being permanently situated outside the hull of the submarine whatever the position (raised or lowered) of the masts,

at least one sealed protecting structure surrounding the masts, this structure being sealingly connected to the hull and being arranged so as to allow sealed sliding of the masts,

at least two through means passing sealingly through the hull of the submarine and adapted so as to provide, through said hull, the transmission of the signals supplied by the respective sighting heads,

at least two receiving means for receiving the signals from the respective sighting heads, these receiving means being situated inside the hull of the submarine and connected respectively to said through means,

a single observation post situated inside the hull of the submarine and adapted to allow observation of the signals received by the receiving means,

and switching means inserted between the observation post and the receiving means for selectively connecting the observation post with one of the receiving means.

4,447,130

LIGHT-WEIGHT MIRROR BLANK FOR ASTRONOMICAL PURPOSES AND METHOD OF MAKING A SUPPORTING FRAMEWORK FOR SUCH BLANKS

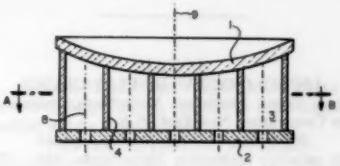
Uwe Christiansen, Gelnhausen; Karlheinz Rau, Hanau; Anton Steinkohl, Gründau, and Bruno Streb, Freigericht, all of Fed. Rep. of Germany, assignors to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

Filed Apr. 7, 1982, Ser. No. 366,254

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1981, 3116357

Int. Cl.³ B32B *3/12;* G02B *5/08*

U.S. Cl. 350—310 **7 Claims**



1. In a light-weight mirror blank for astronomical purposes, having a mirror plate of transparent vitreous silica or high-silica glass, a back plate of transparent or opaque vitreous silica or high-silica glass, a supporting framework of transparent or opaque vitreous silica or high-silica glass, disposed between the mirror plate and the backplate comprising several rows of tubes, the rows of tubes being staggered and the individual tubes being permanently bonded to the mirror plate and the back plate, and the tube axes being parallel to one another and to the mirror axis, the improvement wherein the tube rows are staggered such that each tube of a row has a contact line or contact strip with two adjacent tubes of an adjacent row, the wall thickness of the tubes in the area of contact line or contact strip is reduced with respect to the rest of the thickness of the wall of the tube and the tubes are welded together along the contact line or contact strip.

4,447,131

LIQUID CRYSTAL DRIVING APPARATUS

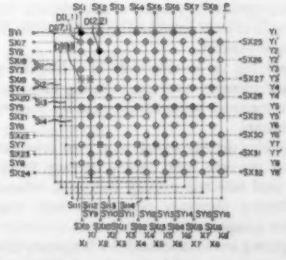
Tsunenori Soma, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1982, Ser. No. 352,264

Claims priority, application Japan, Mar. 3, 1981, 56-29425

Int. Cl.³ G02F *1/13*

U.S. Cl. 350—333 **5 Claims**



4. Apparatus for driving liquid crystal that defines a liquid crystal panel having two surfaces, said apparatus comprising:

a first signal line group arranged on one surface of said liquid crystal panel;

a second signal line group arranged on another surface of said liquid crystal panel;

a third signal line group arranged on the same surface of said liquid crystal panel as is said first signal line group;

a fourth signal line group arranged on the same surface of said liquid crystal panel as is said second signal line group;

time division driving signal generating means for supplying time division driving signals to said first and fourth signal line groups; and

selection driving signal generating means for supplying selection driving signals to said second and third signal line groups in synchronism with the time division driving signals generated by said time division driving signal generating means.

4,447,132

LIQUID CRYSTAL DISPLAY DEVICE

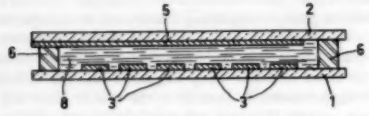
Maarten de Zwart, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 17, 1981, Ser. No. 244,543

Claims priority, application Netherlands, Mar. 17, 1980, 8001556

Int. Cl.³ G02F 1/137

U.S. Cl. 350—346 **8 Claims**



1. An electro-optic liquid crystal matrix display device comprising:

two parallel supporting plates,

patterns of strip-shaped electrodes crossing each other on facing surfaces of said supporting plates to form a matrix of display elements at said crossings,

a layer of cholesteric liquid crystal between said facing surfaces and having a positive dielectric anisotropy,

wherein said layer has at least one of a substantially transparent planar-conical texture or a light-scattering focal-conical texture below a first field strength E_1, a transparent homeotropic-nematic texture above a second field strength E_2, and at least one of a light-scattering focal-conical texture or a transparent homeotropic-nematic texture at field strengths between E_1 and E_2, such that said liquid crystal exhibits hysteresis upon application of voltage to said device,

wherein said liquid crystal has a negative dielectric anisotropy above a critical frequency of said electric field, such that said liquid crystal combines hysteresis with dielectric anisotrophy inversion,

means for applying an electric field at a frequency below said critical frequency over each display element to provide said transparent homeotropic-nematic texture in said display elements,

means for applying display signals to at least selected display elements to provide said light-scattering focal-conical texture in said selected display elements, wherein non-selected display elements remain in said transparent homeotropic-nematic texture, and

means for applying an electric field at a frequency above said critical frequency over said non-selected display elements to provide said transparent planar-conical texture in said non-selected display elements, said selected display elements remaining in said light-scattering focal-conical texture.

4,447,133

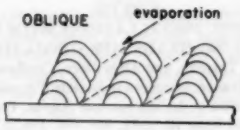
ELECTROCHROMIC DEVICE

Taisuke Miyoshi, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Apr. 27, 1981, Ser. No. 257,873

Int. Cl.³ G02F 1/17

U.S. Cl. 350—357 **16 Claims**



1. In an electrochromic device of the type having a substrate, an electrode disposed on the substrate, a layer of electrochromic material disposed in a predetermined pattern on the electrode and an electrolyte disposed on the layer of electrochromic material, the improvement comprising: said layer of electrochromic material having anisotropic topography formed by depositing by evaporation said electrochromic material such that the direction of evaporation makes an acute angle in the range of from 30° to 70° with respect to the normal to said substrate.

4,447,134

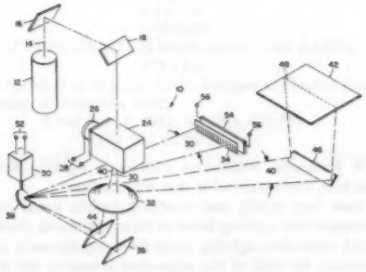
GRATING SIGNAL SYSTEM USING ZERO ORDER BEAM OF ACOUSTO-OPTIC MODULATOR

Bernard M. Rosenheck, Dix Hills, N.Y., assignor to Litton Systems, Inc., College Park, Md.

Filed Mar. 23, 1981, Ser. No. 245,877

Int. Cl.³ G02F 1/11; H01J 40/14

U.S. Cl. 350—358 **6 Claims**



1. An optical system for document recording having a source of electromagnetic energy which is passed through an acousto-optic modulator to generate a zero order beam and, when said modulator is energized by a modulating signal, a first order beam, comprising:

grating and detector means;

first optical means for directing said zero order beam through said grating onto said detector means to generate a grating signal;

second optical means for directing said first order beam upon said document when said acousto-optic modulator is energized by said modulating signal;

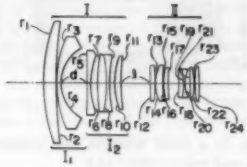
amplifier means for receiving said grating signal to produce an output grating signal; and

said amplifier means also receiving said modulating signal for increasing the gain of said amplifier when said acousto-optic modulator is energized to produce a constant envelope level output grating signal.

4,447,135
ZOOM LENS SYSTEM

Akiyoshi Nakamura, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 164,509, Jul. 2, 1980, abandoned. This application Feb. 22, 1983, Ser. No. 468,642
Claims priority, application Japan, Jul. 13, 1979, 54-89433
Int. Cl.³ G02B *13/04, 15/14*
U.S. Cl. 350—426 18 Claims



1. A zoom lens system comprising:

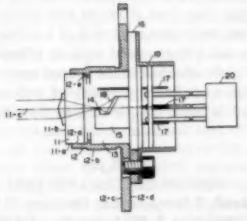
a first lens group of a negative refractive power including a first sub-group located at the front of the zoom lens system and a second sub-group located at the image side of the first sub-group with a first variable air space formed between the first and second sub-groups; and

a second lens group of a positive refractive power located at the image side of the first lens group with a second variable air space formed between the first and second lens groups, the first and second lens groups being shiftable along the optical axis with the second variable air space varying in zooming operation, and the first lens group being shiftable along the optical axis with the first variable air space varying in focusing operation, wherein the first sub-group includes a negative component at the image side end thereof so that the first variable air space is directly next to the negative component.

4,447,136
SEMI-CONDUCTOR LASER DEVICE

Takashi Kitamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1981, Ser. No. 281,727
Claims priority, application Japan, Jul. 18, 1980, 55-98305
Int. Cl.³ G02B *3/02*
U.S. Cl. 350—432 9 Claims



1. A semi-conductor laser device, comprising:

a semi-conductor laser chip for generating a laser beam;

an aspherical single lens for collimating the laser beam from said semi-conductor laser chip, said lens having an outer peripheral surface extending in parallel to the optical axis thereof;

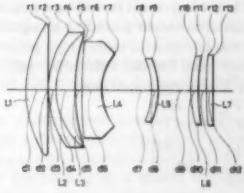
a protective casing for said semi-conductor laser chip, said casing having an exit window for supporting therein said lens, said exit window having an inner peripheral surface formed for cooperation with said outer peripheral surface of said lens to permit movement of said lens only in the direction of the optical axis thereof during assembly of the semi-conductor laser device, said casing further having another surface extending perpendicularly to said inner peripheral surface of said exit window; and

a base member for supporting said semi-conductor laser chip and having a mounting surface engaged with said other surface of said casing, said base member supporting said semi-conductor laser chip so as to generate the laser beam substantially perpendicularly to said other surface of said casing, said base member further being movable, relative to and along said other surface of said casing during assembly of the semi-conductor laser device, whereby focus adjustment of said lens and the alignment of said semi-conductor laser chip with said lens are permitted during assembly of said semi-conductor laser device.

4,447,137
LARGE-APERTURE TELEPHOTO LENS

Yasunori Arai, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1982, Ser. No. 420,683
Claims priority, application Japan, Jan. 23, 1982, 57-9214
Int. Cl.³ G02B *13/02, 9/62*
U.S. Cl. 350—454 4 Claims



1. A large-aperture telephoto lens comprising seven lens elements in six lens components, the first lens component having a positive lens, the second lens component having a doublet composed of a negative-meniscus lens with its concave side facing an image and a positive-meniscus lens, the third lens component having a negative-meniscus lens with its concave side facing the image, the fourth lens having a meniscus lens with its concave side facing an object, the fifth lens component having a positive-meniscus lens with a surface of a larger curvature facing the object, and the sixth lens component having a positive lens, said large-aperture telephoto lens meeting the following requirements:

$$1.60 < \frac{n_1 + n_2}{2}, \; 50 < \frac{\nu_1 + \nu_3}{2}; \tag{1}$$

$$|n_2 - n_3| < 0.1, \; \nu_3 - \nu_2 > 10, \; 0.2f < r_4 < 0.35f; \tag{2}$$

$$0.35f < f_{1,2,3} < 0.55f; \tag{3}$$

$$|f_5| < 4f, \; 0.2f < -r_8 < 0.4f; \tag{4}$$

$$0.35f < r_{10} < f; \text{ and} \tag{5}$$

$$0.25 < f/f_7 < 0.45 \tag{6}$$

where

n_i: the refractive index of the ith lens along d-line,

ν_i: the Abbe number of the ith lens;

f : the focal length of the overall lens system;

r_i: the radius of curvature of the ith surface;

$f_{1,2,3}$: the composite focal length of the first through third lenses; and

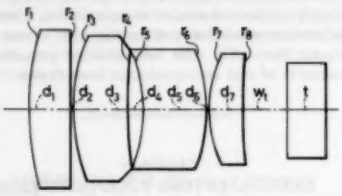
f_i: the focal length of the ith lens.

4,447,138

OBJECTIVE SYSTEM FOR VIDEO DISC

Takahiro Sugiyama, and Yukio Hagiwara, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1982, Ser. No. 357,341
Claims priority, application Japan, Mar. 12, 1981, 56-35719
Int. Cl.³ G02B 9/34
U.S. Cl. 350—472 4 Claims



1. An objective system for a video disc, said objective system including a plurality of lenses each having lens surfaces with at least some of said lens surfaces being separated by air gaps, said objective system including, in order from the object side, a first lens component including a positive meniscus lens L_1, a second lens component including a positive meniscus lens L_2, a third lens component including a negative meniscus lens L_3, a fourth lens component including a positive meniscus lens L_4, and a cover glass for said video disc, said objective system satisfying the following conditions:

(1) $1.7F > F_{1,2} > 1.4F$
(2) $1.35 > F_1/F_2 > 0.75$
(3) $1.0 > F_{1,2}/F_{1,2,3} > 0.8$
(4) $1.1F > d_5 > 0.4F$
(5) $d_6 < 0.5F$
(6) $N_4 > 1.7$,

where F is the composite focal length of the objective system, F_1 is the focal length of said first lens component, F_2 is the focal length of said second lens component, $F_{1,2}$ is the composite focal length of said first and second lens components, $F_{1,2,3}$ is the composite focal length of said first, second, and third lens components, d_i is the distance from the i-th lens surface to the (i+1)-th lens surface in order from said object side, and N_i is the refractive index of the i-th lens numbered from said object side.

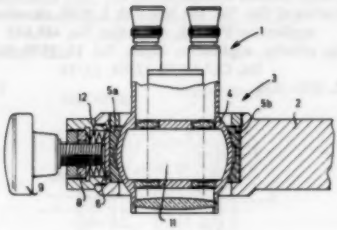
4,447,139

MEANS FOR SECURING AN OBSERVATION INSTRUMENT TO A SUPPORTING STAND

Klaus Biber, Aalen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany

Filed Dec. 3, 1981, Ser. No. 327,189
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 8034520[U]
Int. Cl.³ G02B 21/24; F16C 11/06
U.S. Cl. 350—522 6 Claims

1. In combination, a microscope having a housing, a support, and means including an adjustably securable ball and socket joint connecting said microscope to said support; said housing including a circumferentially continuous convex spherical surface which spans both sides of a great-circle plane, whereby said convex surface is the ball component of the joint; a unipartite or bipartite bearing bushing mounted to said support and having a concave spherical surface in circumferential contact with said convex surface; first means continuously reacting between said support and said bushing for loading said bushing in engagement with said convex surface, to a first level requiring a minimum rotational moment for angular displacement of the microscope with respect to the support; and second means selectively operable for application of additional loading to



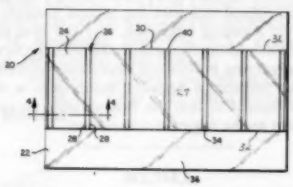
said bushing, to a level wherein said rotational moment is greater than said minimum.

4,447,140

MICROSCOPE SLIDES

Jeptha E. Campbell, 1618 Dell Ter., Cincinnati, Ohio 45230, and James E. Gilchrist, 742 Wooster Pike, Terrace Park, Ohio 45174

Filed Sep. 29, 1982, Ser. No. 428,429
Int. Cl.³ G02B 21/34
U.S. Cl. 350—534 8 Claims



1. A multi chambered slide comprising:

(a) a base plate;

(b) at least three spaced apart boundaries attached to the base plate, each contiguous pair of boundaries defining an area within which a liquid sample may be contained, each boundary having a pair of spaced apart elements between which is defined a boundary zone for containing any sample that may leak from an area defined by a pair of boundaries, each element being of a substantially uniform thickness and being coated with an adhesive; and

(c) a cover plate attached to the spaced apart elements of the boundaries to define a plurality of volumetric chambers into which a liquid sample may be introduced.

4,447,141

VISION TESTING SYSTEM

Arthur Eisenkraft, 7 Iroquois Rd., Ossining, N.Y. 10562

Filed May 7, 1982, Ser. No. 375,805
Int. Cl.³ A61B 3/02
U.S. Cl. 351—237 25 Claims

1. A method of testing a person's vision comprising the steps of:

(A) passing a collimated beam of coherent light waves

through a transparency of an object to produce its diffraction pattern;

(B) passing those light waves forming the diffraction pattern through a first lens to produce the Fourier transform of the object at the Fourier transform plane of the first lens;

(C) spatially filtering at the Fourier transform plane of the first lens the light waves forming the Fourier transform of the object;

(D) passing the spatially filtered lightwaves of the Fourier transform of the object through a second lens to produce the inverse of the Fourier transform at the image plane of the second lens as an image of the object; and

(E) varying the spatial filtering to vary the recognizability of the image of the object by the person being tested;

(F) whereby the relationship between the degree of spatial filtering and the recognizability of the image of the object is a measure of the vision of the person being tested.

4,447,142

BLADE TYPE FOCAL PLANE SHUTTER

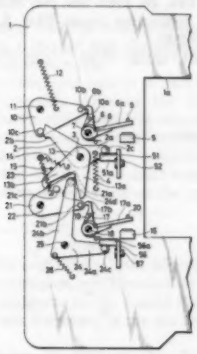
Akira Suzuki, Tokyo; Katumi Kaneko, Ageo, and Nobuyoshi Inoue, Kawagoe, all of Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Sep. 9, 1982, Ser. No. 416,375

Claims priority, application Japan, Sep. 10, 1981, 56-141706

Int. Cl.³ G03B *9/36, 19/12*

U.S. Cl. 354—246 **2 Claims**



1. A blade type focal plane shutter comprising a front blade driving lever movable between its cocked position in which a front blade group is brought to an unfolded position covering an exposure aperture and its uncocked position in which said front blade group is brought to a folded position not covering said exposure aperture, a rear blade driving lever movable between its cocked position in which a rear blade group is brought to a folded position not covering said exposure aperture and its uncocked position in which said rear blade group is brought to an unfolded position covering said exposure aperture, a front blade cocking lever engageable with said front blade driving lever and capable of bringing said front blade driving lever to its cocked position from its uncocked position, a rear blade cocking lever capable of bringing said rear blade driving lever to its cocked position from its uncocked position, a first interlocking lever operatively connected to said front blade cocking lever in order to operate said front blade cocking lever, a second interlocking lever operatively connected to said rear blade cocking lever in order to operate said rear blade cocking lever, and means operatively connected respectively to said first and second interlocking levers and capable of bringing a mirror to the down-position and up-position, said rear blade driving lever being brought to its cocked position from its uncocked position through said second interlocking lever when said mirror is brought to the up-position from the down-position by said means, and said front blade driving lever being brought to its cocked position from its uncocked position through said first interlocking lever when said mirror is brought to the down-position from the up-position by said means.

4,447,143

REFLEX CAMERA WITH ELECTRONIC RANGE FINDER

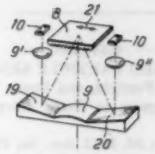
Knut Heitmann, Wetzlar, and Klaus-Dieter Schaefer, Braunfels, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Dec. 6, 1982, Ser. No. 447,166

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151289; Mar. 18, 1982, 3209908

Int. Cl.³ G03B *3/00*

U.S. Cl. 354—407 **16 Claims**



1. An electronic range finder for a reflex camera having an objective lens and a mirror means for reflecting an image of an object to be photographed toward the range finder, said range finder comprising:

a grating located in an image plane of the objective lens;

a pentaprism having a fully reflecting concave mirror formed on the lower edge of its exit surface, for projecting an image of the object to be photographed upon said grating;

an electronic photoelectric receiver system positioned to receive light reflected from said grating; and

wherein said grating comprises a grooved reflecting grating capable of functioning as a spatial frequency filter, the grooves of said grating being shaped so as to split the image light beam into partial beams and the groove plane of said grating being arranged at an angular orientation with respect to the image plane in which the grating is located predetermined in order to reflect said partial beams in a path leading to said receiver system.

4,447,144

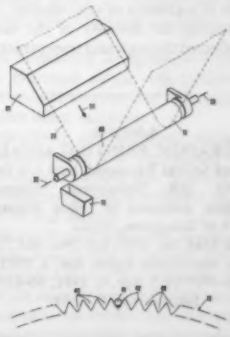
GROOVED ROLLER SUPPORT FOR A BELT XEROGRAPHIC PHOTOCONDUCTOR

David K. Gibson, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 8, 1982, Ser. No. 447,744

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 BE **10 Claims**



1. An electrophotographic reproduction device having a photoconductor belt for receiving toner images from a devel-

oper station containing a mix of toner powder and carrier beads;

at least one roller for supporting said belt by means of engagement with the nonworking, underside of the belt; and

a plurality of generally axially extending, generally V-shaped grooves formed in said roller, said grooves being dimensioned relative the size of said carrier beads so as to hold beads which may escape from the developer and find their way under the photoconductor, said grooves being radially deep enough to conceal said beads from damaging contact to said photoconductor, and being circumferentially closely spaced so as not to form a transverse crease in the photoconductor as the photoconductor wraps a portion of said roller.

4,447,145

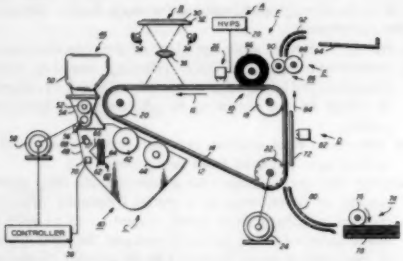
CHARGED PARTICLE SENSOR

Christopher Snelling, Penfield, and Dusan G. Lysy, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 30, 1982, Ser. No. 373,477

Int. Cl.³ G03G *15/08*

U.S. Cl. 355—14 D **28 Claims**



1. An apparatus for sensing electrostatically charged particles, including:

a pair of spaced-apart conductive plates defining a passageway through which a portion of the charged particles flow with at least one of said pair of plates being substantially transparent;

a member secured to one surface of said transparent plate;

means for electrically biasing said transparent plate to attract a portion of the particles to the other surface thereof;

means for tansmitting a beam of energy through said member and said transparent plate with the internal angle of incidence of the beam of energy being greater than the critical angle of incidence of said member; and

means for detecting the intensity of the beam of energy internally reflected through said transparent plate and said member.

4,447,146

PHOTOGRAPHIC PRINTING APPARATUS

Mikio Kogane, and Seiichi Yamazaki, both c/o Fuji Photo Film Co., Ltd., No. 210, Nakanuma, Minami-ashigara-shi, Kanagawa, Japan, assignors to Mikio Kogane and Seiichi Yamazaki, both of Kanagawa, Japan

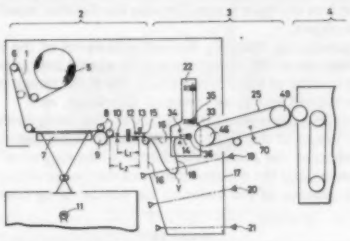
Filed Mar. 30, 1982, Ser. No. 363,733

Claims priority, application Japan, Apr. 1, 1981, 56-47147[U]; Apr. 11, 1981, 56-49197[U]; Apr. 6, 1981, 56-48479

Int. Cl.³ G03B *29/00*

U.S. Cl. 355—28 **19 Claims**

1. A photographic printing apparatus, comprising: a cutter for cutting a strip of photographic printing paper, a hole puncher for making perforations in said strip adjacent to a leading edge thereof, means for engaging a printing paper guide clip in said perforations, a reservoir for temporarily accommodating a portion of said strip continuing from said guide clip, said reservoir disposed between said cutter and said means for engaging said printing paper guide clip, and means



for transferring said guide clip with said leading edge of said strip engaged therewith to a developing apparatus.

4,447,147

OPTICAL SCANNING DEVICE

Yu Yamada, Kokubunji, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1982, Ser. No. 352,713

Claims priority, application Japan, Mar. 9, 1981, 56-33561; May 29, 1981, 56-82681

Int. Cl.³ G03B *27/48, 27/50, 27/70*

U.S. Cl. 355—51 **6 Claims**

1. An optical system for scanning a surface to be scanned in a slit-like form, comprising:

means for forming an image of the surface to be scanned; and

means for scanning the surface to be scanned, said means being disposed between said image forming means and a position whereat the image of the surface to be scanned is formed, said scanning means varying the direction of the optical axis of said system three or more odd number times to thereby make the direction of the optical axis incident on said scanning means and the direction of the optical axis emergent from said scanning means the same.

4,447,148

EDGE PRINTING DEVICE

Van Hatzis, Trumbull, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Sep. 15, 1982, Ser. No. 418,362

Int. Cl.³ G03G *15/00*

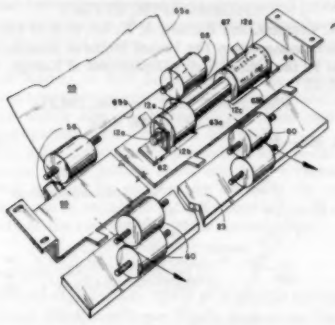
U.S. Cl. 355—75 **5 Claims**

1. An edge printing device for use on a document reproducing apparatus which includes a document exposure station having a predetermined lateral dimension and means for moving the document past the exposure station, said device printing supplemental information along the edge of a copy sheet on which a document having a smaller lateral dimension than said predetermined lateral dimension has been reproduced, said device comprising:

A. support means mounted on said document reproducing apparatus and extending across said document exposure station,

B. an indicia roller rotatably mounted on said support means adjacent one end of said support means in a position to be beyond the longitudinal edge of a document which has a lateral dimension less than said predetermined lateral dimension,

C. a friction roller rotatably mounted on said support means at an intermediate location along said support means such



that said friction roller is in contact with a document as the document is moved past the exposure station of the reproducing apparatus, and

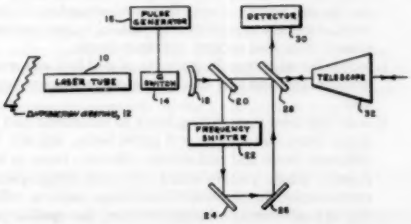
D. means connecting said indicia to said friction roller for movement therewith, whereby the moving document drives said friction roller which in turn rotates said indicia roller so that the supplemental information thereon is copied simultaneously with the image on the document in an edge portion of the copy sheet which is beyond the lateral dimension of the image on the copy sheet.

4,447,149

PULSED LASER RADAR APPARATUS

Stephen Marcus, Lexington, and Theodore M. Quist, W. Acton, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 17, 1981, Ser. No. 274,698
Int. Cl.³ G01C *3/08*; G01P *3/36*
U.S. Cl. 356—5 **5 Claims**



1. A pulsed laser radar apparatus comprising in combination:

a Q-switched pulsed laser beam unit to generate a laser pulse signal, said laser pulse signal comprising a high intensity laser pulse with a substantially lower intensity CW trailing tail portion,

a local oscillator forming means receiving said laser pulse signal, said local oscillator forming means utilizing said trailing tail portion of said laser pulse signal to generate a local oscillator signal,

a signal resolution means receiving said laser pulse signal which was generated in said Q-switched pulse laser beam unit, said signal resolution means transmitting said laser pulse signal to a target, said signal resolution means receiving a target echo signal, said signal resolution means increasing the resolution of both said transmitted laser pulse signal and said target echo signal, said target echo signal being combined with said local oscillator signal to provide a target signal, and

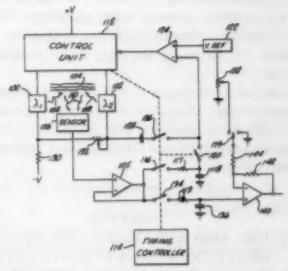
a signal detecting means receiving said target signal, said signal detecting means comprising a heterodyne detector unit, said signal detecting means detecting said target signal to provide a target return.

4,447,150

APPARATUS AND METHOD FOR MEASURING BLOOD OXYGEN SATURATION

Stanley O. Heinemann, Irvine, Calif., assignor to Bentley Laboratories, Irvine, Calif.

Filed Feb. 27, 1981, Ser. No. 236,941
Int. Cl.³ G01N *21/27, 33/48*
U.S. Cl. 356—41 **33 Claims**



1. An apparatus for measuring a selected parameter of a blood sample, comprising:

a first radiation source of a first wavelength;

a second radiation source of a second wavelength;

means for positioning said radiation sources to irradiate said sample;

sensor means responsive to radiation from said sources, having an electrical output and positioned to receive radiation from said sources after reflection from said sample and reject other radiation;

means for selectively and adjustably energizing said first radiation source such that the amount of its radiation reflected from said sample and received by said sensor means remains substantially constant regardless of the reflectivity of said sample;

means for selectively and adjustably energizing said second radiation source such that its radiant output is related to the radiant output of said first radiation source;

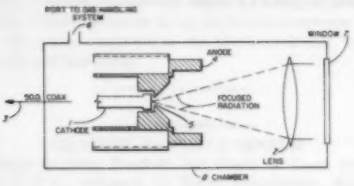
circuit means for developing a signal related to the ratio of the reflected radiation received by said sensor means from said first and second radiation sources;

circuit means responsive to said signal for producing a resultant signal representative of said selected parameter.

4,447,151
METHOD AND APPARATUS FOR FAST LASER PULSE DETECTION USING GASEOUS PLASMAS

Edward J. McLellan, Los Alamos, and John A. Webb, Albuquerque, both of N. Mex., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Jun. 18, 1981, Ser. No. 274,917
Int. Cl.³ G01J 1/42; H01J 40/00
U.S. Cl. 356—218 **9 Claims**



1. Apparatus for detection and monitoring of subnanosecond risetime, intense, pulsed laser radiation utilizing the "hot" electron phenomenon comprising in combination:

(a) means for generating and collecting "hot" electrons which comprises:

(i) a conducting circular disk cathode;

(ii) a conducting, cylindrically symmetric electron collecting anode which is insulated from and coaxial with said cathode and which has means of disposal as a part thereof forming a circular entrance hole adjacent to and having a smaller diameter than said cathode; and

(iii) a transition structure to allow said anode and cathode to make electrical contact with an about 50Ω impedance coaxial cable without significant mismatch;

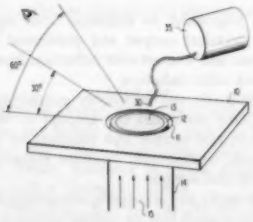
(b) means for focusing incident laser radiation onto said cathode

(c) means for detecting and recording voltages changing in subnanosecond timescale which are produced from said "hot" electrons having traveled from said cathode to said anode as a result of said focused laser radiation impinging on said cathode.

4,447,152
METHOD AND APPARATUS FOR DETECTING DEFECTS IN APERTURED PLATES

Robert E. Rainford, Essex Junction; Mark M. Moser, South Burlington, and Jon R. Ojala, Colchester, all of Vt., assignors to IBM Corp., Armonk, N.Y.

Filed Dec. 24, 1981, Ser. No. 334,183
Int. Cl.³ G01N 21/88
U.S. Cl. 356—237 **10 Claims**



1. The method of inspecting an apertured plate comprising:

directing an intense polychromatic collimated light beam perpendicular to a major dimension of said plate and parallel to axes of apertures therethrough,

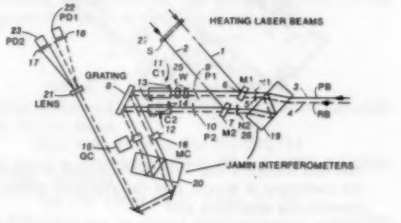
viewing the beam passing through the apertures at an angle of between 30° and 60° to the plane of a major dimension of the plate,

whereby defects or irregularities in the plate or said apertures result in one or more bright spots.

4,447,153
APPARATUS AND METHOD FOR QUANTITATIVE MEASUREMENT OF SMALL DIFFERENCES IN OPTICAL ABSORPTIVITY BETWEEN TWO SAMPLES USING DIFFERENTIAL INTERFEROMETRY AND THE THERMOOPTIC EFFECT

David A. Cremers, and Richard A. Keller, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 8, 1982, Ser. No. 386,371
Int. Cl.³ G01B 9/02
U.S. Cl. 356—361 **29 Claims**



12. An apparatus for measuring small differences between weak optical absorptions of sample comprising solutions of solutes in substantially identical solvents using differential interferometry and the conversion of absorbed radiation into heat for the solute, which comprises in combination:

a. a probe laser beam;

b. a reference laser beam approximately parallel to and narrowly-spaced from said probe laser beam;

c. a first amplitude controlled heating laser beam;

d. a second amplitude controlled heating laser beam;

e. an interferometer, which further comprises:

i. a first laser transmitting block to split said probe laser beam and said reference laser beam incident thereon into a first probe beam and a second probe beam, and a first reference beam and a second reference beam, respectively, said first probe beam and said first reference beam emerging approximately parallel and narrowly-spaced and widely-spaced from said second probe beam which emerges approximately parallel to and narrowly-spaced from said second reference beam;

ii. means for adjusting the intensity of said first and second probe beams and said first and second reference beams; and

iii. a second laser transmitting block to recombine said first probe beam and said second probe beam, and said first reference beam and said second reference beam to form a probe fringe pattern and a reference fringe pattern, respectively, the position of said fringe patterns reflecting any differential change between the optical pathlengths of said first and second probe beams and said first and second reference beams as they traverse the space between said first and second laser transmitting blocks,

iv. means for making colinear said first and said second heating laser beams with said first and second probe laser beams, respectively;

v. means for equalizing the intensity of said first and second heating laser beams after they have emerged from said colinear making means;

vi. means for correcting any non-parallel deviations of said first probe and reference laser beams, and said

second probe and reference laser beams, if necessary, to insure that said first and second probe beams and said first and second reference beams are colinear when recombined in said second laser transmitting block;

vii. two sample cells hereinafter to be identified as cell one and cell two, which contain the samples under investigation, and through which said first probe beam colinear with said first heating laser beam and said first reference beam narrowly separated from said first probe beam, and said second probe beam colinear with said second heating laser beam and said second reference beam narrowly separated from said second probe beam pass, respectively, after leaving said heating laser intensity equalizing means;

viii. means for stabilizing said reference fringe pattern with respect to drift due to air currents, variations in room temperature, and thermal gradients in said sample cells which also simultaneously stabilizes said probe fringe pattern with respect to said drift;

ix. means for detecting the position of said probe fringe pattern which pattern shifts due to the thermooptic effect induced by said heating beams in the samples, which can be related to the difference in optical absorptivity of the two samples under investigation.

4,447,154

METHOD FOR DETECTING FOCUS OF IMAGE

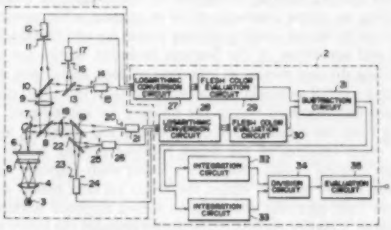
Takashi Fukui, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jun. 19, 1981, Ser. No. 275,286

Claims priority, application Japan, Jun. 20, 1980, 55-83663

Int. Cl.³ G01J *3/46*

U.S. Cl. 356—404 **2 Claims**



1. A method for detecting whether a picture image recorded on a color recording medium is out of focus comprising the steps of: dividing the picture image into minute picture elements, detecting which portions of the picture image are of flesh color by separating the picture elements according to color transmission factor or color density of the picture elements, and detecting whether or not the picture image is out of focus from measurements on the flesh color portions.

4,447,155

DETECTION OF LIGHT-AFFECTING SUBSTANCE IN A FLUID

Colin A. Simpson, Iver, England, assignor to Graviner Limited, England

Filed Mar. 19, 1981, Ser. No. 245,565

Claims priority, application United Kingdom, Mar. 29, 1980, 8010686

Int. Cl.³ G01N *1/26, 21/11*

U.S. Cl. 356—437 **5 Claims**

1. Apparatus for detecting a light-affecting substance in a fluid, comprising

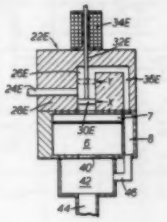
a housing,

a plurality of solenoid-operated valves mounted side-by-side in the housing and each having a respective inlet pipe, a respective outlet pipe, a respective bypass pipe, a respective solenoid coil, and a respective valve member which is movable by the solenoid coil between a closed position in which it blocks communication between the valve inlet pipe and the valve outlet pipe but connects the valve inlet pipe to the bypass pipe and an open position in which it connects the valve outlet pipe to the valve inlet pipe and blocks communication between the valve inlet pipe and the bypass pipe;

a common diffusing chamber defined in the housing immediately adjacent to the solenoid-operated valves and to which the valve outlet pipes are immediately connected;

a common measuring chamber defined by the housing immediately adjacent to the diffusing chamber and to which the diffusing chamber is immediately connected;

a bypass chamber defined by the housing and to which all the bypass pipes are connected;



a fan unit supported by the housing and in common communication with the measuring and bypass chambers to apply suction to the valves and to all the bypass pipes whereby the suction applied by the bypass pipes via the bypass chamber to the valve inlet pipes of all the valves whose valve members are in the closed position draws fluid into, so as to fill, each such valve inlet pipe, and the suction applied via the measuring chamber and the diffusing chamber to the valve inlet pipe of each valve whose valve member is in the open position draws a sample of fluid from that valve inlet pipe through the diffusing chamber into the measuring chamber;

photo-electric detectig means in the measuring chamber for photo-electrically detecting a light-affecting substance in each fluid sample; and

control means for energizing the solenoid coil in a predetermined sequence.

4,447,156

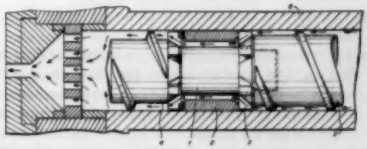
MODULAR MIXING APPARATUS INCLUDING INTERCHANGEABLE FLUID PROCESSING MEANS

Desider G. Csongor, Rangley, Me., assignor to Northern Lights Trust, Raingeley, Me.

Filed Aug. 31, 1981, Ser. No. 298,065

Int. Cl.³ B01F *7/08;* B29B *1/06*

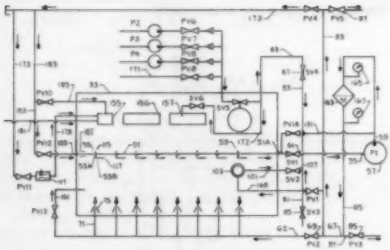
U.S. Cl. 366—80 **12 Claims**



1. Improved modular mixing apparatus for use with an extruder screw and barrel assembly to extrude fluid material, said apparatus including a rotatable driver shaft having a threaded end for engagement with the extruder screw, stationary sleeve means located around the driver shaft in spaced relation

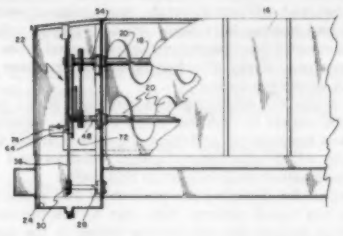
thereto and presenting opposite bearing ends, shear ring elements rotatable with the driver shaft and occurring in abutting relationship to the opposite bearing ends of the stationary sleeve, and fluid processing means detachably connected to the driver shaft.

4,447,157
FLUID MIXING SYSTEM WITH INDUCTOR CLEANOUT
Gene E. Underwood, P.O. Box 2685, Conroe, Tex. 77305
Filed Jul. 2, 1982, Ser. No. 394,658
Int. Cl.³ B01F *5/10, 15/02*
U.S. Cl. 366—137 **8 Claims**



1. A fluid mixing system comprising:
a container having a given length,
injection means for injecting fluid into said container in a direction to cause the fluid to swirl around an axis along the length of said container,
first suction conduit means located in said container generally along said axis and having a plurality of spaced apart inlet means along its length for the flow of fluid from said container into said first suction conduit means,
each of said inlet means comprising an inductor conduit having a portion which extends into said first suction conduit means and which has an opening within said first suction conduit means which faces one end of said first suction conduit means,
pump means having an inlet coupled to said one end of said first suction conduit means and an outlet coupled to said injection means,
second suction conduit means coupled to the bottom portion of said container and to said inlet of said pump means,
first valve means coupled between said one end of said first suction conduit means and said inlet of said pump means,
second valve means coupled between said outlet of said pump means and said injection means,
third valve means coupled to said second suction conduit means,
a reverse flow conduit means coupled from said outlet of said pump means to said first suction conduit means at a position between said first valve means and said inlet means, and
fourth valve means coupled to said reverse flow conduit means,
said pump means being allowed to withdraw fluid from said first suction conduit means for flow to said injection means for injection back into said container when said first and second valve means are open and said third and fourth valve means are closed,
said pump means being allowed to withdraw fluid from said container by way of said second suction conduit means for flow into said first suction conduit means by way of said reverse conduit means for cleaning out said inductor conduits when said third and fourth valve means are open and said first and second valve means are closed.

4,447,158
APPARATUS AND METHOD FOR MIXING PARTICULATE MATERIAL
Clarence W. Simon, P.O. Box 714, Scott City, Kans. 67871
Filed Dec. 7, 1981, Ser. No. 327,962
Int. Cl.³ B01F *7/08*
U.S. Cl. 366—297 **4 Claims**



1. An apparatus for mixing particulate material in the bed of a truck comprising: a mixing chamber; a plurality of auger means rotatably disposed within said mixing chamber for moving and mixing said particulate material; auger driving means engaging said auger means for rotating the same, said auger driving means including a master drive chain means; an auger driving housing for housing said auger driving means; power means for powering auger driving means; and a lower oil tank means secured to said housing and containing a reservoir of oil in contact with the drive chain means and wherefrom the drive chain means picks up oil for self-oiling and scrubbing of the features included within the auger rotating driving means; said auger driving housing comprises an upper oil tank means including an upper reservoir of oil in contact with certain features of the auger rotating driving means for additional self-oiling and scrubbing of the features included within the auger rotating driving means; at least one oil feed splash pan means having a spout means in communication with the upper oil tank means and disposed within the housing for catching oil dripping from the master drive chain means and splashing against the other features of the auger rotating driving means; said auger driving means comprises a lower shaft-sprocket combination means secured within the lower oil tank means and an upper shaft-sprocket combination means disposed within said housing, a master endless chain means engages the lower shaft-sprocket combination means and the upper shaft-sprocket combination means while a master spring-loaded tension idler means is positioned and attached within said housing and engages the master endless chain means for achieving satisfactory tensioning of the master chain means during operation; said auger driving means additionally comprises a pair of lower auger shaft-sprocket combination means and a pair of upper auger shaft-sprocket combination means, a first auger chain means inter-engaging one of the lower auger shaft-sprocket combination means and one of the upper auger shaft-sprocket combination means, a second auger chain means inter-engaging the remaining lower auger shaft-sprocket combination means and the remaining upper auger shaft-sprocket combination means, a first auger upper shaft-sprocket chain means inter-engaging one of the lower auger shaft-sprocket combination means and the upper shaft-sprocket combination means and a second auger upper shaft-sprocket chain means inter-engaging the remaining lower auger shaft-sprocket combination means and the upper shaft-sprocket combination means, each of said first and second auger chain means and said first and second auger upper shaft-sprocket chain means being engaged by a spring-loaded tension idler means positioned and attached within said housing for achieving satisfactory tension of each of the same during operation; said apparatus additionally comprising a rocker arm means secured within said housing in proximity to one of the upper auger shaft-sprocket com-

bination means, said rocker arm means additionally having a rocker arm spring-loaded means attached to the rocker arm means and to the housing.

4,447,159

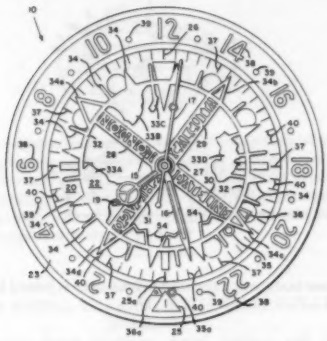
UNIVERSAL WORLD TIME AND DATE CLOCK

Barton L. Weller, Box 68, Monroe, Conn. 06468

Filed Jun. 14, 1982, Ser. No. 388,245

Int. Cl.³ G04B *19/22*

U.S. Cl. 368—23 **10 Claims**



1. A twenty-four hour date clock comprising a casing containing a chronometer mechanism comprising at least one central axial shaft which is adapted to make one complete clockwise revolution every twenty-four hours, a dial on said casing having a central opening, a geographic hand member attached to said shaft through said central opening of the dial and extending parallel to and closely spaced from the surface of said dial for 360° rotation with said shaft around said dial, said hand member comprising indicia of geographic areas of the Earth in various geographically-accurate radial directions relative to the axis of rotation of said hand member which coincides with the axis of rotation of the Earth, and at least one date pointer means adjacent an extremity of said hand member and located in a geographically-accurate position relative to said geographic areas to indicate the time zone of the International Date Line, visually-distinguishable old day- and new day-indicating symbols on the clockwise and counterclockwise sides of said pointer means, respectively, said dial comprising a fixed midnight mark which is located for alignment with said pointer means of said hand member once during each twenty-four hour rotation of said hand member to coincide with the end of the old calendar day and start of another new calendar day in the time zone of the International Date Line, visually-associatable companion old day- and new day-indicating symbols affixed to said dial on the counterclockwise and clockwise sides of said midnight mark, respectively, and adjacent thereto, said clock providing a visual indication of geographic areas of the World experiencing the old day, comprising the geographic area indicia present on said hand means in the counterclockwise portion thereof located between the midnight mark on the dial and said hand member, said geographic area being visually-illustrated as the area between said companion old day symbols, and geographic areas experiencing the new day, comprising the geographic area indicia present on said hand means in the clock-wise portion thereof located between the midnight mark on the dial and said hand member, said geographic area being visually-illustrated as the area between said companion new day symbols.

4,447,160

LEAP YEAR COMPENSATION CIRCUIT

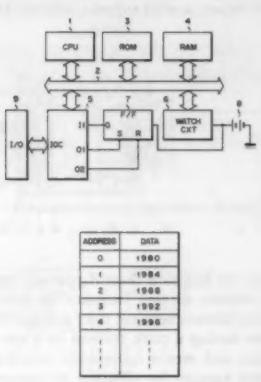
Kowji Tanikawa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 368,310, Apr. 14, 1982, abandoned. This application Sep. 28, 1983, Ser. No. 536,237

Claims priority, application Japan, Apr. 22, 1981, 56-60781; Apr. 22, 1981, 56-60782

Int. Cl.³ G04B *19/24, 27/00*

U.S. Cl. 368—34 **11 Claims**



ADDRESS	DATA
0	1980
1	1984
2	1988
3	1992
4	1996

1. A leap year compensation circuit comprising electronic watch means for generating date data including at least year, month and day,

memory means for storing leap year data respectively representing a plurality of leap years, and

juding/compensating means connected to said electronic watch means and said memory means, for comparing the date data generated by said electronic watch means and the leap year data stored in said memory means, and for judging whether or not the date data corresponds to the leap year data and is after the end of February, and leap year setting means for recording leap year judgement and incompletion of leap year compensation in accordance with a judgement result,

said comparing means having function compensating for said watch means for a leap year date in accordance with the judgment result and the content of said recording means.

4,447,161

PNEUMATIC TIMER

Kurt Stoll, Lenzhalde 72, 7300 Esslingen, Fed. Rep. of Germany, and Hans-Heinrich Glaettli, Seestr. 252, CH-8700 Küsnacht ZH, Switzerland

Filed May 6, 1982, Ser. No. 375,530

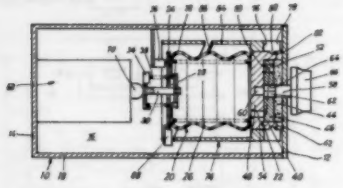
Claims priority, application Fed. Rep. of Germany, May 14, 1981, 3119089

Int. Cl.³ G04B *1/26, 9/00*

U.S. Cl. 368—65 **18 Claims**

15. A pneumatic timer, comprising: a faceplate; a control member movably supported on one side of said faceplate; a bellows supported on the side of said faceplate opposite said one side and having two ends, said ends of said bellows being movable toward and away from each other between first and second positions and being closer to each other in said second position than in said second position; resilient means for yieldably urging said ends of said bellows toward said first position; selectively actuable means for effecting movement of said ends of said bellows from said first position to said second position against the urging of said resilient means; means for facilitating a rapid escape of gas from the interior of said bellows to the

exterior thereof as said ends of said bellows are moved from said first to said second position; means defining a passageway providing fluid communication between the interior of said bellows and the exterior thereof; adjustable choke means operatively coupled to said control member for selectively varying the cross-sectional area of a portion of said passageway in response to movement of said control member in order to control the rate of flow of gas through said passageway from the exterior to the interior of said bellows as said ends thereof are moved from said second position to said first position by said resilient means; a mark support supported in the region of



said faceplate on said side thereof opposite said one side for movement relative to said faceplate in directions approximately parallel thereto between third and fourth positions, said mark support having a mark thereon on a side thereof facing said faceplate; and means operatively coupling said bellows and said mark support for effecting movement of said mark support between said third and fourth positions in response to movement of said ends of said bellows between said first and second positions; wherein said faceplate has means for facilitating observation of said mark on said mark support from said one side of said faceplate.

4,447,162

WATCHCASE

Gen Mitamura; Takao Eguchi, and Yukio Nagami, all of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

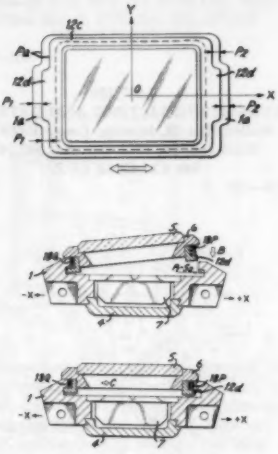
Continuation-in-part of Ser. No. 42,131, May 24, 1979. This application Jan. 2, 1981, Ser. No. 221,980

Claims priority, application Japan, Sep. 8, 1978, 53-110881

Int. Cl.³ G04B *37/00*

U.S. Cl. 368—295 **10 Claims**

1. A watchcase comprising: a case body having oppositely disposed internal recesses therein; a bezel; a support member fixedly connected to said bezel, said support member having an outwardly extending flange extending in an outward radial direction of the watchcase from the upper end surface of the support member and having at least a pair of peripheral beads extending further outwardly from said flange and engageable with respective ones of said recesses; means defining clearances between the flange peripheral beads and the case body recesses to permit sufficient movement of the bezel relative to the case body in a diametrical direction of the watchcase to enable removal of the bezel from the case body without causing deformation of the case body, bezel or support member; biasing means for resiliently biasing the bezel to a balanced position in which the flange peripheral beads engage with respective ones of the case body recesses to thereby removably join said bezel to said case body; and wherein said recesses have a sloping surface defining an angle of less than 45° with respect to the diametrical direction of the watchcase, the length l of the peripheral beads of the support member being longer than the thickness t of the flange of the support member so that the peripheral beads can be displaced in the diametrical direction of the watchcase, and the peripheral beads of the support member contacting the sloping surface of the recesses



of the case body when the support member is joined to the case body.

4,447,163

STEM MECHANISM FOR A WATCH

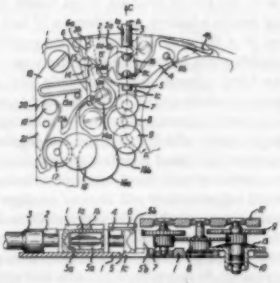
Nobuo Tsukada, and Isamu Nishida, both of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Jan. 11, 1982, Ser. No. 338,236

Claims priority, application Japan, Jan. 23, 1981, 56-9190

Int. Cl.³ G04B *27/04, 27/02, 19/22;* G04C *3/00*

U.S. Cl. 368—319 **6 Claims**



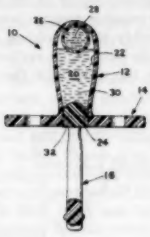
1. A winding stem mechanism for a watch comprising: a winding stem axially displaceable to a plurality of positions for setting a wheel train, for switching a reset switch, and for correcting a time, a slidable pinion slidably and rotatably mounted on a center line of the winding stem, one of the stem and pinion having a square hole extending axially in the direction of the winding stem and the other having a square rod which slidably engages with the square hole so that rotational movement of the winding stem is transmitted to the pinion, and wherein the outer diameter of the stem is substantially the same as that of the pinion.

4,447,164

TEMPERATURE-RESPONSIVE PACIFIER ASSEMBLY

Dieter R. Berndt, Neptune, N.J., assignor to TRP Energy Sensors, Inc., New York, N.Y.

Filed Feb. 22, 1982, Ser. No. 351,107
Int. Cl.³ G01K *11/12, 1/08*
U.S. Cl. 374—162 **9 Claims**



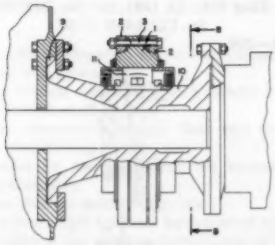
1. A heat-responsive pacifier assembly comprised of a pacifier body including a nipple portion having a chamber, a liquid sealingly disposed in said chamber and a liquid crystalline composition disposed in said liquid, said liquid crystal composition displaying a color change visually through said pacifier body at a temperature above 98.6° F.

4,447,165

BUCKET WHEEL BEARING WITH SPLIT ROLLING BEARING

Peter Kersten; Peter Meixner; Erich Müller, and Eckart Höring, all of Magdeburg, German Democratic Rep., assignors to VEB Schwermaschinenbaukombinat TAKRAF, Leipzig, German Democratic Rep.

Filed Apr. 28, 1982, Ser. No. 372,593
Claims priority, application German Democratic Rep., Dec. 2, 1981, 2353275
Int. Cl.³ F16C *35/00*
U.S. Cl. 384—428 **6 Claims**



1. A bucket wheel bearing assembly adapted to be attached to a bucket wheel support structure for rotationally supporting a bucket wheel shaft on the support structure, comprising

bucket wheel bearing means to be disposed on said bucket wheel shaft;

a bearing box situated outside said bucket wheel bearing means, said bearing box including at least a first bearing half and a second bearing half so that the first and second bearing halves, when assembled together, cover the bucket wheel bearing means entirely at the inside surface thereof, said bearing box having a central projection with slanted side faces at the entire outer surface thereof and two side walls, said slanted side faces extending radially outwardly toward said central projection from both said side walls,

locking means to be disposed alongside of said central projection of said bearing box, said locking means having inner slanted faces to mate with said slanted side faces of the bearing box so that when the locking means is connected to the bearing box, the first and second bearing halves are tightly and evenly connected together with forces radially inwardly applied to the slanted side faces of the bearing box from the locking means, and

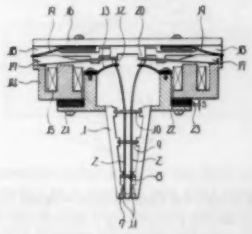
a plurality of fastening means for connecting the locking means around the bearing box, some of the fastening means connecting the locking means and bearing box to the support structure.

4,447,166

PRINTING HEAD OF DOT PRINTER

Kuniaki Ochiai; Masami Horii, and Takashi Norigoe, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed May 24, 1982, Ser. No. 381,446
Claims priority, application Japan, Jun. 4, 1981, 56-86141
Int. Cl.³ B41J *3/12*
U.S. Cl. 400—124 **6 Claims**



4. A printing head for a dot printer, said printing head comprising:

(a) a cover;

(b) a guide holder mounted on said cover;

(c) a needle guide surface on said guide holder, said needle guide surface having:

(i) a groove formed therein the width of which is a little greater than the diameter of the working ends of the needles and

(ii) a plurality of needle support holes formed in the bottom of said groove and having a diameter which is a little greater than the corresponding needle diameter;

(d) a plurality of needles disposed in said guide holder and slidably projecting through said holes, each of said needles normally being disposed in a first position in which it projects through one of said holes by a first amount which is less than the depth of said groove;

(e) electromagnetic means for driving said plurality of needles from said first position to a second position in which they project through said holes by a second amount which is greaer than the depth of said groove;

(f) mechanical means for returning said plurality of needles from said second position to said first position after each actuation thereof; and

(g) spacer means disposed between said cover and said guide holder, said spacer means including a removable gauge spacer the thickness s of which is less than the stroke of said needles, said removable gauge spacer being disposed between said cover and said guide holder such that, when said removable gauge spacer is in position and said needles are in their first position, the working ends of said needles are beneath said needle guide surface by a distance greater than or equal to the distance s, which distance is sufficient so that said needles will disengage completely from a printing ribbon passing over said needle guide surface, and, in the absence of said removable gauge spacer, the

working ends of said needles are coincident with or beneath said needle guide surface.

4,447,167

STACKING DEVICE FOR DATA CARRIERS

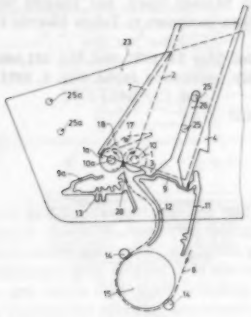
Edmund Euteneuer, Grünebach, and Friedhelm Eckhardt, Siegen, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 14, 1981, Ser. No. 330,635

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1980, 3047277

Int. Cl.³ B41J *11/58, 13/10*

U.S. Cl. 400—625 **7 Claims**



1. A stacking device for data carriers ejected from a printing mechanism, said device comprising a detachable stacking magazine; two feed rollers arranged on respective roller shafts at the underside of said magazine, and defining a symmetry plane; means for selectively mounting said magazine for stacking to a selected side of said plane; and means for diverting an ejected carrier toward said selected side into the magazine,

characterized in that said stacking magazine comprises one or more moderately spring-biased guides disposed above and spaced from said rollers, fixed to the magazine, said guides having free ends extending through said symmetry plane and having a distal portion extending below said roller shafts, arranged to divert the ejected data carriers over that roller which is on the selected side of said plane into the stacking magazine, and

further characterized in that the device comprises a switching shaft arranged above the feed rollers, extending in said plane of symmetry; a double lever mounted on the switching shaft, a respective arm of the lever projecting into the stacking magazine responsive to the placement of the magazine on the respective side of the symmetry plane; a switch mounted to said device outside the stacking magazine; and means for actuating the switch responsive to pivoting of the double lever in either direction for providing an electrical signal when a magazine has been filled with ejected carriers.

4,447,168

BOTTOM MARGIN INDICATOR APPARATUS FOR TYPEWRITERS AND THE LIKE

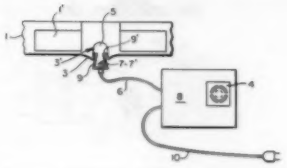
Carol M. Rines, 13 Spaulding St., Concord, N.H. 03301, and Duane Marshall, 9 Hadley Rd., Lexington, Mass. 02173

Filed Jul. 7, 1981, Ser. No. 281,084

Int. Cl.³ B41J *29/18*

U.S. Cl. 400—708 **8 Claims**

1. In combination, bottom margin indicator apparatus and a typewriter having a platen rotatable about an axis, said platen having a cylindrical surface, a cylindrical-section paper shield mounted immediately below the platen so that paper is advanced along a path transverse to said axis during typewriting between an upper surface of the shield and the platen; said shield being provided with an aperture extending transversely of the shield, the edges of the aperture comprising a track; said apparatus having photo-sensitive monitor means for sensing the presence and absence of paper, said monitor means mounted within an assembly block provided with means for slideably supporting the assembly block on the track for movement transverse of the shield and for positioning the assembly block at a predetermined region of the track, suspended therefrom, and with the monitor means there-exposed through the aperture, said assembly block holding the monitor means in close proximity to the said upper surface of the shield but not substantially above the same and the assembly block itself



being disposed below said surface in order to position the monitor means substantially at said surface and thus in noninterfering relationship with, but in closest proximity to, the paper passed between the same and the platen irrespective of the thickness of the paper; signaling means connected to and responsive to the sensing by the monitor means of the absence of paper at said predetermined region following the presence of paper thereat for providing an indication of such absence; means for electrically powering the monitor and signaling means; and means for preventing spurious signals from being applied to said signaling means that would effect spurious and multiple indications as the bottom edge of the paper passes by the monitor means.

4,447,169

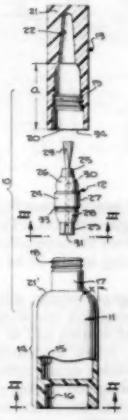
AUTOMATIC APPLICATOR BOTTLES

Victor Vartoughian, 358 N. Ridgewood Pl., Los Angeles, Calif. 90004

Filed Mar. 23, 1981, Ser. No. 246,726

Int. Cl.³ A46B *17/04*

U.S. Cl. 401—269 **12 Claims**



1. An applicator for dispensing liquids or the like automatically, said applicator comprising:

a bottle means for containing liquid, said bottle means having an open neck formed at one end thereof;

a cap removably mounted on said bottle means, said cap having an interior surface; and

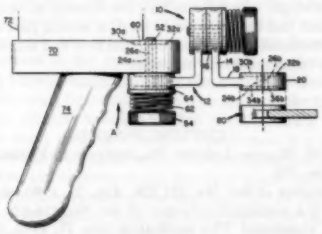
a brush having a passageway extending therethrough, a plurality of bristles and a first body means for retaining said plurality of bristles in fluid communication with said passageway and for releasably securing said brush in a first position on said bottle means such that said plurality of bristles project into said neck of said bottle means, said brush also having a second body means for releasably securing said brush in a second position on said bottle means such that said plurality of bristles project away from said neck of said bottle means, said first body means having a first surface which conforms to said interior surface of said cap to provide a fluid tight seal between said first surface and said interior surface when said cap is mounted on said bottle means with said brush in said second position, said second body means having a second surface which also conforms to said interior surface of said cap to provide a fluid tight seal between said second surface and said interior surface when said cap is mounted on said bottle means with said brush in said first position.

4,447,170

CONNECTION ASSEMBLY FOR USE WITH AN ARTICULATED LINKAGE SYSTEM

Ralph Holmes, 216 Diana Dr., Burley, Id. 83318

Filed Mar. 2, 1982, Ser. No. 353,964
Int. Cl.³ F16C *11/00*
U.S. Cl. 403—64 **2 Claims**



1. An articulated linkage system for interconnecting a camera and a flash unit, comprising:

a mounting bracket connectable to a camera and having a through bore formed therein,

a flash arm connectable to said flash unit and having a through bore formed therein, and

linkage means for interconnecting the mounting bracket with the flash arm;

wherein said linkage means comprises:

first and second angle brackets having arms with through bores formed in end portions thereof, one of the through bores of the first bracket being aligned with the through bore in the mounting bracket, and one of the through bores of the second bracket being aligned with the through bore in the flash arm, other through bores of said angle brackets being aligned with each other,

a plurality of bolts, each bolt having a shaft extending through a respective one of the pairs of aligned through bores for interconnecting the parts having the through bores, each bolt further having an enlarged head connected to a proximal end of the shaft for limiting movement of the shaft in a first direction with respect to the through bores, and each bolt further having a pin carried by a distal end of the shaft, the pin having an end portion protruding from the shaft, each through bore having an enlarged portion for passage of the pin end portion through the through bore and terminating in an end surface with a recess formed therein for receiving the pin end portion, the pin when received in said recess preventing movement of the shaft in a direction opposite the first direction, and

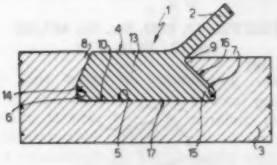
biasing means positioned between the enlarged head of the bolt and the pin for exerting a biassing force on the parts interconnected by the bolt tending to fix the angular relationship of the parts with respect to each other.

4,447,171

DEMOUNTABLE SEALED JOINT FOR THE FLUID TIGHT CONNECTION OF A SHEET MEMBER TO A SUPPORT

Viscardo Baldoni, and William J. Vorih, both of Rome, Italy, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 16, 1981, Ser. No. 302,910
Claims priority, application Italy, Nov. 7, 1980, 68705 A/80
Int. Cl.³ B25G *3/08*; F16D *1/00*
U.S. Cl. 403—381 **9 Claims**



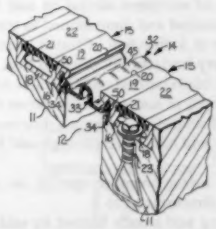
1. A demountable sealed joint for the fluid tight connection of a sheet member to a support, said joint comprising a bead forming a portion of said sheet member, and a seat for said bead provided on said support and consisting of a groove having a substantially dovetail cross-section and provided the first and second undercuts; said bead having, in cross-section, a shape substantially conjugate with that of said seat and provided with first and second extensions engaging said first and second undercuts respectively; characterized in that said bead is substantially rigid in a transverse direction, said second undercut being deeper than the first, and said sheet member extending from said bead substantially at the base of said second extension and at a predetermined distance from said first extension.

4,447,172

ROADWAY EXPANSION JOINT AND SEAL

Richard N. Galbreath, Wilsons, Va., assignor to Structural Accessories, Inc., Lenoir, N.C.

Filed Mar. 18, 1982, Ser. No. 359,216
Int. Cl.³ E01C *11/04*
U.S. Cl. 404—68 **12 Claims**



8. An elastomeric membrane adapted to extend across and sealingly close a longitudinally extending expansion gap between adjacent structural members, said membrane comprising a central web portion and a pair of integral ear-like transverse edge portions extending outwardly along respective sides of said web portion, said edge portions being solid and mirror images of each other in cross section, with each edge portion

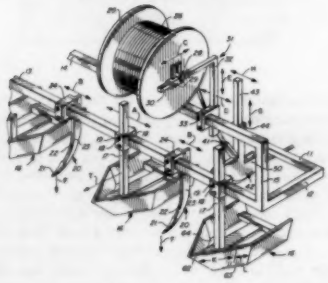
extending outwardly in the transverse direction beyond the adjacent web portion on each side thereof, and including an outer surface facing in a direction away from said web portion, said outer surface including a curved recess disposed at a medial location along the transverse dimension thereof, and being of a size sufficient to permit the edge portions to laterally flex to facilitate assembly thereof into a receiving socket or the like.

4,447,173

APPARATUS FOR BURYING DRIP IRRIGATION TUBING

Charles R. Schultz, Rte. 1, Box 115A, Coolidge, Ariz. 85228; Mark S. Tollefson, 508 East Irene, Casa Grande, Ariz. 85222, and Howard A. Wuertz, Rte. 1, Box 115A, Coolidge, Ariz. 85228

Filed Feb. 17, 1983, Ser. No. 467,383
Int. Cl.³ E02F *5/10*
U.S. Cl. 405—181 **2 Claims**



1. Apparatus for burying conduit from a supply thereof in a plowed field having

a plurality of generally parallel elongate, upstanding, spaced beds of earth, and

a plurality of elongate spaced furrows, each furrow generally lying along and following a generally horizontally oriented imaginary line,

each elongate bed generally lying in between a pair of said furrows, said apparatus comprising

(a) a frame,

(b) a plurality of members carried on said frame and each shaped, contoured and dimensioned to track along one of said furrows in a direction of travel generally parallel to said imaginary horizontally oriented line;

(c) at least one blade carried on said frame to cut a trench in one of said beds as said apparatus moves in said direction of travel and shaped to generate a downward pull on said apparatus as said blade cuts through said bed to form said trench; and

(d) a conduit laying member carried on said frame and shaped and dimensioned to

(i) track along said trench formed by said blade,

(ii) allow conduit to move therethrough to be dispensed into said trench formed by said blade;

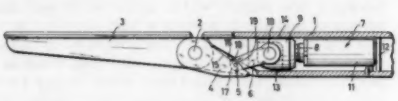
said tracking members and said conduit laying member having bottom edges which contact said furrows and trench respectively and tend to counteract said downward force generated as said blade moves through said earth in said bed such that the depth of said trench being cut in said bed tends to be substantially constant along the length thereof.

4,447,174

CAP POSITIONING MECHANISM

Kunibert Becker, Werl; Gerd Dunkel; Gunter Lagodka, both of Lunen, and Rudiger Kirchbrucher, Dortmund-Brackel, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenbutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Feb. 26, 1982, Ser. No. 352,984
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1981, 3107209
Int. Cl.³ E21D *17/054*
U.S. Cl. 405—293 **18 Claims**



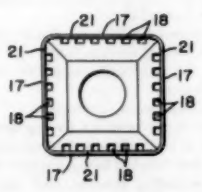
1. A cap-positioning mechanism for adjusting the angular position of an auxiliary cap relative to a main cap, the auxiliary cap and the main cap comprising the roof cap of a mine roof support unit, the auxiliary cap being connected to the main cap by a first pivot joint, the mechanism comprising a hydraulic ram and a lever acting between the main cap and the auxiliary cap, wherein the auxiliary cap is provided with an extension arm projecting from the first pivot joint towards the main cap, one end portion of the lever being connected to the arm by a second pivot joint, and the other end of the lever being connected to a first part of the ram by a third pivot joint, the lever having a length which is less than the distance between the first pivot joint and the third pivot joint, a second part of the ram being attachable to the main cap, the first and second parts of the ram being relatively movable.

4,447,175

CUTTING INSERT

Donald W. Warren, Latrobe, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Continuation of Ser. No. 181,770, Aug. 27, 1980, abandoned, which is a continuation-in-part of Ser. No. 116,679, Jan. 30, 1980, abandoned. This application Jun. 17, 1982, Ser. No. 389,406
Int. Cl.³ B26D *1/00*
U.S. Cl. 407—114 **4 Claims**



1. A cutting insert for removing material from a workpiece which comprises: a body that has top and bottom faces and a peripheral wall joining said faces; said body having a polygonal shape when viewed in plan; cutting edges formed at the juncture of said peripheral wall with one of said top and bottom faces; a land area extending inwardly from the cutting edge; a planar descending wall extending from the land area downwardly to a planar floor which extend toward the center of said body; individual discrete recesses for imparting a stiffer configuration to the material removed from the workpiece, said recesses formed and spaced inwardly from and along the length of the cutting edges in the upper portion of said planar descending wall; said recesses when viewed in side appearing concave facing outwardly and extending from the land area

inwardly, and portions of said planar descending wall forming side walls separating and bounding said recesses.

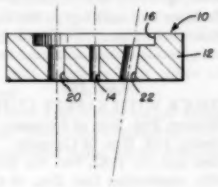
4,447,176
TEMPLATE FOR MORTICE CYLINDER LOCK REMOVAL

LeVone A. Blough, 95 Horseshoe Dr., Longwood, Fla. 32779, and David L. Gregory, 10207 Union Park Dr., Orlando, Fla. 32817

Division of Ser. No. 146,213, May 5, 1980, abandoned. This application Jan. 7, 1982, Ser. No. 337,840

Int. Cl.³ B23B *49/02*

U.S. Cl. 408—72 R **5 Claims**



1. A drill template for facilitating the removal of a cylinder of a mortice or similar lock from a structure in which the lock is installed, comprising template means for aligning the drill on the face of the lock, the template means having at least one aperture formed therein to allow cutting away of a fastener holding the lock and the structure by drilling through the aperture formed in the template means, the template means comprising a body member having a disclike conformation and having a first, inner face engageable with the lock, the first face of the body member having a central circular recess formed therein, the body member having a slot formed in a second, outer face of said body member, the slot extending through the body member and opening on the first face of said body member, the slot further extending diametrically across the second face of the body member and communicating with the recess over less than the full diameter of said recess, the aperture positioning a drill for cutting of the fastener on positioning of the template over the lock to allow the fastener to be cut away without damage to internal keyway structure of the lock.

4,447,177
TOOL HOLDER WITH TOOL POSITION COMPENSATING MECHANISM

Yoshiki Ochiai, Okazaki; Kenji Nomura, Aichi; Tetsuro Yamakage, Anjo, and Toshiharu Takashima, Chiryu, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 9, 1981, Ser. No. 281,781

Claims priority, application Japan, Jul. 10, 1980, 55-97825[U]

Int. Cl.³ B23B *47/18, 49/00*

U.S. Cl. 408—161 **6 Claims**

1. A tool holder for use in connection with a machine tool comprising:

a shank receivable in a tool spindle rotatably supported in a spindle head of said machine tool;

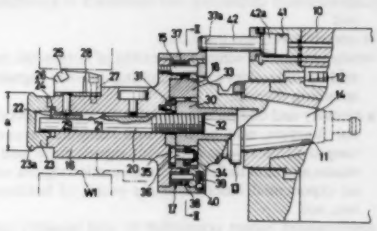
a tool mounting shell securedly connected to said shank and adjustably movably carrying a cutting tool in a radial direction of said mounting shell;

a screw shaft axially slidably but non-rotatably supported in said tool mounting shell and having a cam surface which is sloped along the axis of said tool mounting shell;

transmitting means interposed between said cutting tool and said cam surface of said screw shaft for adjustably moving said cutting tool in the radial direction by wedging action of said cam surface upon axial movement of said screw shaft;

a rotary member rotatably received and threadedly engaged with said screw shaft;

a ring shaped internal gear member rotatably supported on the external peripheries of said shank and said mounting shell adapted to be fixed relative to said spindle head for bringing about relative rotation between said internal gear member and said mounting shell upon rotation of said tool spindle; and



reduction gear means for transmitting rotation of said mounting shell relative to said internal gear member to said rotary member at a predetermined reduction gear ratio, wherein said reduction gear means further comprises a rotatable planet gear engaged with said internal gear member.

4,447,178
HORIZONTAL DRILLING AND MILLING MACHINE WITH A HEADSTOCK MOVING UP AND DOWN IN GUIDES

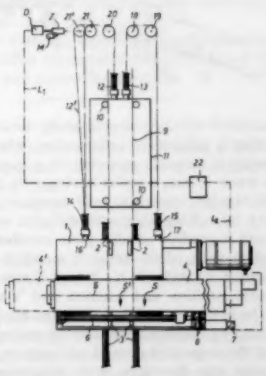
Karl-Josef Esser, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Scharmann GmbH & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Feb. 25, 1982, Ser. No. 352,332

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1981, 3108934

Int. Cl.³ B23B *47/26;* B23C *1/02*

U.S. Cl. 409—80 **5 Claims**



1. In a horizontal drilling and milling machine of the type comprising a vertically movable headstock, a spindle sleeve mounted for horizontal run-out from said headstock such that an outer end of said spindle sleeve undergoes a vertical deflection relative to said headstock, which deflection is an exponential function of the extent of said run-out, and correcting means comprising a counterweight at least two reversing rolls, two cables traveling over said reversing rolls to form first and

second generally vertical cable sections connected, respectively, to said counterweight and said headstock, and means for displacing said first cable section to move said headstock in a vertical plane in response to said run-out, the improvement comprising:

means constraining said counterweight for vertical movement and preventing horizontal displacement thereof,

means mounting the first of said reversing rolls for movement in a radial direction to move said first cable section in a manner displacing said headstock in a vertical plane, and

said correcting means including:

sensing means for sensing the extent of horizontal run-out of said spindle sleeve and emitting run-out signals corresponding thereto;

a memory and computer apparatus for storing said exponential function, said memory and computer apparatus arranged to receive said run-out signals from said sensing means and emit deflection compensation signals which are an exponential function of the extent of horizontal run-out, and

displacement means connected to said memory and computer apparatus and responsive to said deflection compensation signals for radially moving said first reversing roll to incline said headstock in a vertical plane about a horizontal axis in a manner effecting a vertical correction displacement of said outer end of said spindle sleeve, which displacement is an exponential function of the extent of said horizontal run-out so as to maintain said outer end of said spindle sleeve on a zero deflection path.

4,447,179

TRACER HEAD ADJUSTMENT METHOD

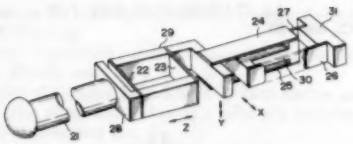
Etuo Yamazaki, Hachioji, Japan, assignor to Fujitsu Fanuc Limited, Tokyo, Japan

Continuation of Ser. No. 23,461, Mar. 23, 1979, abandoned. This application Jun. 2, 1982, Ser. No. 384,289

Claims priority, application Japan, Mar. 23, 1978, 53-33399

Int. Cl.³ B23Q *33/00, 35/30*

U.S. Cl. 409—127 **1 Claim**



1. A method of adjusting a horizontally mounted tracer head assembly that is subject to deformation, wherein the tracer head assembly is movably mounted on a machine frame and includes a tracer frame, a stylus having a tip that has a reference position with respect to said machine frame and said stylus being interchangeable with different styluses, support members and respective parallel plate members connected to corresponding ones of the support members for permitting displacement of the stylus in X-, Y- and Z-axis directions from said reference position and wherein said Y-axis direction is selected to be in the vertical direction, and displacement detectors for detecting displacements corresponding to the relative positions of the respective ones of said support members along the respective axis directions from corresponding reference displacements, said method comprising the steps of:

(a) changing the stylus of the tracer head assembly to one having a different weight so that the displacements detected by said displacement detector corresponding to said Y-axis direction is different from the respective one of said reference displacements,

(b) detecting a voltage across the Y-axis displacement detector for detecting the displacement, corresponding to the relative position of the respective support member with respect to the corresponding reference displacement along said Y-axis direction;

(c) displaying data corresponding to the deviation of the detected voltage from a corresponding reference voltage corresponding to the respective reference displacement along said Y-axis direction;

(d) adjusting the Y-axis displacement detector until the voltage of the Y-axis displacement detector is approximately equal to said reference voltage; and

(e) moving the tracer head assembly in the Y-axis direction relative to the machine frame to bring the tip of the stylus being employed to said reference position,

wherein deformation of said horizontally mounted tracer head in said vertical direction is compensated for so as to simultaneously provide said reference voltage from said position detector and said top of the stylus at said reference position with respect to said machine frame.

4,447,180

CHUCK WITH SAFETY CUTOUT

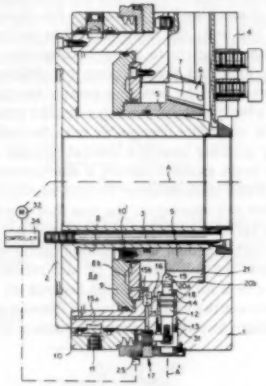
Karl Pesch, Dillingen, Fed. Rep. of Germany, assignor to Röhm GmbH, Sontheim, Fed. Rep. of Germany

Filed Jan. 21, 1982, Ser. No. 341,582

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1981, 3102099

Int. Cl.³ B23C *9/00*

U.S. Cl. 409—232 **7 Claims**



1. A power chuck comprising:

a chuck body rotatable about an axis, forming an axially extending cylinder and a radially extending cylinder, and having a front face;

drive means for rotating said chuck body about said axis;

a plurality of jaw members displaceable radially on said front face between a pair of radially inner and outer end positions;

an operating member axially displaceable on said body between a pair of axially offset end positions;

mechanism between said jaw members and said operating member for displacing said jaw members toward said radial inner positions on displacement of said operating member in a first axial direction and for displacing said jaw members toward said radial outer positions on displacement of said operating member in a second axial direction opposite said first direction on said body;

a drive piston in the axial cylinder of said body, fixed on and axially jointly displaceable with said operating member and forming in said axial cylinder at least one compartment pressurizable to urge said drive piston and said operating member in one of said axial directions;

a control piston displaceable radially in the radial cylinder

between a chuck-ready position and a chuck-unready position;

a spring braced against said control piston and urging same radially inward into said chuck-unready position;

means including passages between said cylinders for urging said control piston into said chuck-ready position when said compartment is pressurized; signal means including

a nonradially projecting boss on said control piston,

a nonradially projecting formation on said operating member engageable radially outward with said boss only in said end positions on said members, and

inclined camming formations on said operating member and engageable with said nonradial boss of said control piston at said end positions of said operating member for camming said control piston into said chuck-unready position and for holding said control piston in said chuck-unready position and generating an output when said one of said members is in either of its said end positions; and

control means connected to said signal means and to said drive means for preventing rotation of said body by said drive means when said signal means generates said output.

4,447,181

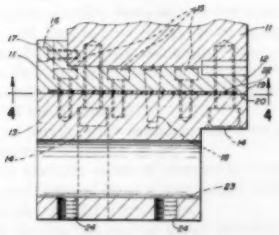
TOOL HOLDER

Toshitake Asano, Tokyo, Japan, assignor to Ikegai Tekko Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1982, Ser. No. 416,088

Int. Cl.³ B23B *47/00*

U.S. Cl. 409—345 **10 Claims**



1. A tool holder for mounting a tool to a carrier, comprising:

a base member;

means for mounting the base member to a carrier;

a tool holding member, said members defining confronting transverse surfaces, at least one of said surfaces being provided with a shallow recess extending from the center thereof to a peripheral portion thereof fully surrounding the recess, said recess opening toward the other surface;

means for securing the tool holding member to the base member with at least portions of said confronting transverse surfaces at opposite sides of the recess in direct mechanical facial engagement; and

a flat, transverse, continuous pad of resilient readily compressible material complementary to and received in said recess to be compressed between said members for effectively minimizing chattering of a tool carried by said tool holder in machining use in a direction transverely to said transverse surfaces, the thickness of the pad being substantially greater than the corresponding depth of the recess.

4,447,182

FIXING PLUG

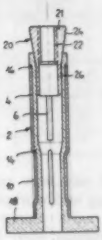
Julius Murbach, Lindengut 15, 8750 Glarus, Switzerland, assignor to Julius Murbach and Karl Stüssi, both of Glarus, Switzerland

Filed Feb. 24, 1981, Ser. No. 237,580

Claims priority, application Switzerland, Mar. 5, 1980, 1744/80

Int. Cl.³ F16B *13/10*

U.S. Cl. 411—45 **20 Claims**



1. A fixing plug comprising:

an expanding element;

a metallic expanding sleeve having a slotted end portion;

said expanding element cooperating with said slotted end portion of said metallic expanding sleeve such that said expanding element can be at least partially axially drawn into the metallic expanding sleeve by means of a screw element connectable with said expanding element;

said expanding element having at least one metallic connection portion;

said metallic connection portion of said expanding element cooperating by means of an oscillation damping material with said expanding sleeve;

said expanding sleeve having an end portion located opposite said slotted end portion;

at least said oppositely located end portion being provided with an inner lining protruding past said oppositely located end portion and formed of said oscillation damping material; and

the oscillation damping material comprises an elastomeric material which is arranged as an inner lining of the slotted end portion and protrudes therepast.

4,447,183

MACHINE PARTS EXPANDER HOLD DOWN

Fred W. Yunt, Cypress, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Aug. 24, 1981, Ser. No. 295,333

Int. Cl.³ F16B *13/06*

U.S. Cl. 411—57 **5 Claims**

1. A reusuable fastener device for releasably joining a workpiece to a work support surface in a tight relationship comprising:

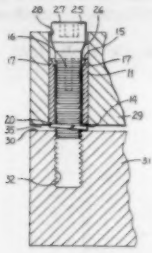
a tubular body having two ends, one of the said ends being the first to be inserted into a mating bore in said workpiece to engage said work support surface, the other end being securely and releasably attachable to said workpiece, the tubular body having a length dimension less than the thickness of the portion of the workpiece to be fastened to said work support surface;

expandable means forming the latter inserted portion of said tubular body, for grippingly engaging said bore provided in said workpiece;

split ring means on the end of said tubular body being receivable in said bore and having a portion thereof displacable longitudinally relative to said tubular body for establish-

ing the proper depth of insertion of said tubular body into said bore; and

means insertable into said tubular body, for expanding said latter inserted portion of said tubular body into gripping



engagement with said bore and having threaded means thereon for pulling said workpiece into tight mating relationship on said work support surface after said latter portion of said tubular body is expanded into gripping engagement with said bore in said workpiece.

4,447,184

APPARATUS FOR SEALING CONTAINERS

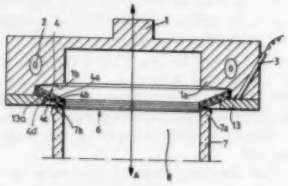
Hermann Buri, and Beat Karth, both of Kirchberg, Switzerland, assignors to Nyffeler, Corti AG, Kirchberg, Switzerland

Filed Sep. 21, 1982, Ser. No. 420,830

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1981, 8129904[U]

Int. Cl.³ B21D *51/00*

U.S. Cl. 413—26 **3 Claims**



1. Apparatus for sealing a thin closure lid, particularly a metallic lid, coated with thermoplastic material to the rim of a container, particularly a glass container, comprising a heatable sealing head and a resiliently yielding pressure element for transmitting pressure and heat to said lid, said pressure element including at least one cup spring and, in the relaxed state thereof, a conical contact surface intended to come in contact with said lid, said contact surface being designed to bend back resiliently upon encountering the resistance of said container rim, said contact surface extending from said sealing head obliquely inward away from said sealing head.

4,447,185

CONTAINER TIPPING APPARATUS

David S. Robinson, and Rupert M. Taylor, both of Mhlume, South Africa, assignors to Mhlume (Swaziland) Sugar Company Limited, Mhlume, South Africa

Filed Oct. 9, 1980, Ser. No. 195,682

Claims priority, application United Kingdom, Oct. 11, 1979, 7935266

Int. Cl.³ B65G *65/34*

U.S. Cl. 414—420 **17 Claims**

1. A container tipping apparatus, comprising:

support means;

carrier means;

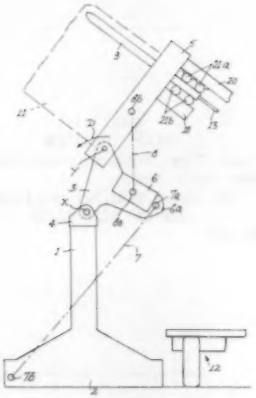
coupling means for coupling said support means to said carrier means;

first means for rotatably mounting said coupling means to said support means so that said coupling means is rotatable relative to said support means between a first lowest extreme position and a first elevated extreme position;

second means for rotatably mounting said carrier means to said coupling means;

means for rotating said coupling means and said carrier means so that said carrier means is rotatable between a second lowest extreme position whereat said carrier means is engaged with a container located adjacent said tipping apparatus and a second elevated extreme position whereat said container is positioned to discharge its contents due to gravitational forces;

said second rotatable mounting means allowing said carrier means to rotate freely relative to said coupling means and in a direction opposite to a direction of rotation of said coupling means as said coupling means is rotated by said



rotating means between said first lowest extreme position and a position above said first lowest extreme position;

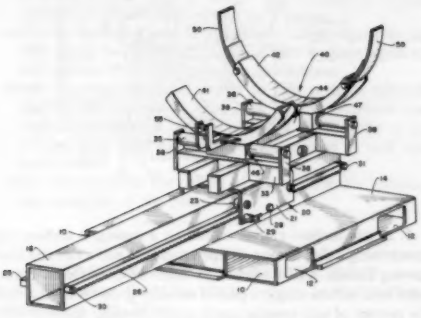
said first rotatable mounting means being fixed in position and located at a predetermined height, said second rotatable mounting means being movable and being located at a height below said fixed predetermined height when said coupling means and said carrier means are at said first and second lowest extreme positions, respectively, said second rotatable mounting means being located at a height above said predetermined height when said coupling means is at said position above said first lowest extreme position; and

said coupling means including an abutment member which engages said carrier means after said coupling means has been rotated to said position above said first lowest extreme position from said first lowest extreme position, said abutment member causing said carrier means to rotate integrally with said coupling means as said coupling means is further rotated by said rotating means between said position above said first lowest extreme position and said first elevated extreme position.

4,447,186
AIRCRAFT LOADING ADAPTER FOR USE WITH ORDNANCE LIFT VEHICLE

Vernon E. Renfro, Somis; Ronald L. Gudgeon, Ventura; John P. Clelland, Redondo Beach, and Clyde C. Cole, Ventura, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 29, 1982, Ser. No. 363,349
Int. Cl.³ B66F 9/14
U.S. Cl. 414—589 10 Claims



1. An ordnance loading adapter for use with the fork-lift mechanism of a lift fork-lift vehicle to permit ease in accurately positioning an ordnance load into alignment with mounting means on an aircraft for attachment thereto, comprising:

a. an adapter base means operable to be secured to the fork-lift mechanism of a fork-lift vehicle;

b. A longitudinal trolley beam mounted on said adaptor base means; said longitudinal trolley beam being of substantially greater length than said adapter base and providing a boom-like extension extending well beyond one edge of said adapter base to provide a substantially extended reach to the lift mechanism;

c. a pair of parallel track means mounted on both sides of said longitudinal trolley beam;

d. a trolley platform means of inverted U-shaped cross-section operable to saddle said longitudinal trolley beam and ride on said parallel track means;

e. a linear bearing rod support means mounted on said trolley platform means and having at least two parallel lateral bearing rods mounted thereon in an axial direction which is 90 degrees transverse to the axial direction of said longitudinal trolley beam and said track means;

f. a load support means adapted to hold an ordnance load; said support means slideably affixed to and operable to be moved and ride on said lateral bearing rods transversely to the axial direction of said longitudinal trolley beam to provide movement in a lateral direction;

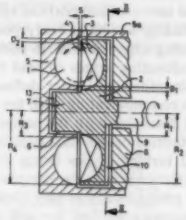
g. said linear bearing rod support means also being swivelly mounted on said trolley platform means for rotation in the horizontal plane;

h. movement of said trolley platform along said track means being operable to provide fore or aft movement of said ordnance load while movement of said load support means on said lateral bearing rods being operable to simultaneously provide lateral movement of said ordnance load whereby accurate and finite positioning of said ordnance load to mounting means on an aircraft is permitted.

4,447,187
LATERAL-DUCT FAN

Rüdiger Galtz, Munich, and Rudolf Reinhardt, Krailling, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Gauting, Fed. Rep. of Germany

Filed Dec. 28, 1982, Ser. No. 454,025
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1982, 3203325
Int. Cl.³ F04D 29/34
U.S. Cl. 415—53 R 16 Claims

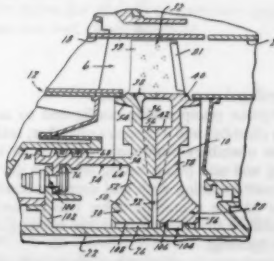


1. A lateral-duct fan having a housing with a lateral duct, of approximately the shape of a torus cut normally to its axis of symmetry, in an inner boundary surface thereof, and having an impeller with axially-symmetrically lined-up blades in a ring-shaped recess within a boundary surface on a front side thereof, said impeller being arranged coaxially with respect to said lateral duct with its recess disposed facing essentially opposite the lateral duct and with an axial gap between said boundary surfaces, wherein the radii of inner and outer edges of the ring-shaped recess, measured at the boundary surface of the impeller, are smaller than the inner and outer radii of the respective closest edge of the lateral duct, measured at the boundary surface of the housing.

4,447,188
COOLED TURBINE WHEEL

Arthur M. Davis, Wixom, and Warren J. Pollington, Southfield, both of Mich., assignors to Williams International Corporation, Walled Lake, Mich.

Filed Apr. 29, 1982, Ser. No. 372,914
Int. Cl.³ F01D 5/08
U.S. Cl. 415—115 2 Claims



1. A unitary turbine wheel for a gas turbine engine having a turbine shaft, said turbine wheel comprising, in combination, a pair of initially separate discs, a plurality of initially separate turbine blades, and an initially separate rotor support, each of said discs including a hub portion having side portions, respectively, a relatively thin intermediate portion formed integrally with and disposed radially outwardly of said hub portion and having a maximum axial dimension less than the maximum axial dimension of said hub portion, and a rim portion formed integrally with and disposed radially outwardly of said intermediate portion and having a maximum axial dimension

greater than the maximum axial dimension of said intermediate portion, each of said discs also including a plurality of angularly spaced, radially extending rib portions formed integrally with and projecting axially from the intermediate portions of said discs, radially extending edge portions of said rib portions and radially extending edge portions of said rim portions of said discs being radially aligned and disposed in axially spaced relationship with respect to the radially extending side portions of said hub portions of said discs, one of said discs including an integral flange portion projecting axially outwardly from said intermediate portion of said one disc on the side thereof opposite the ribs on said intermediate portion, said initially separate rotor support including a tubular body portion, said radially extending confronting edges of said rib portions and said radially extending confronting edges of said rim portions being diffusion bonded together, said discs defining an air passageway therebetween communicating with the radially innermost end of one of said discs and with the periphery of one of said rim portions, said turbine blades each defining air passageways therethrough, said turbine blades being diffusion bonded in angularly spaced relationship to the peripheral surfaces of said discs with the air passageways in said blades communicating with the air passageway defined by said discs, said tubular body portion of said rotor support being diffusion bonded to said flange portion provided on said one disc.

4,447,189

CENTRIFUGAL PUMP FOR MOVING GASEOUS LIQUIDS

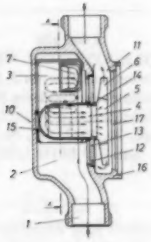
Niels D. Jensen, and Kurt F. Nielsen, both of Bjerringbro, Denmark, assignors to Grundfos A/S, Bjerringbro, Denmark

Filed Jan. 25, 1982, Ser. No. 342,644

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1981, 810230[U]

Int. Cl.³ F01D *25/30*

U.S. Cl. 415—168 **4 Claims**



1. A centrifugal pump comprising:

(a) a one-piece pump casing configured so as to define a suction chamber and a pressure chamber, said suction and pressure chambers communicating via an interchamber opening and said pump casing having a gas exhaust taphole communicating with said suction chamber;

(b) a disc having a configuration which conforms to the configuration of said interchamber opening and having a central opening;

(c) a gas separator mounted in said suction chamber, said gas separator comprising a gas-water inlet, a water outlet and a gas outlet said gas separator being fastened relative to the longitudinal axis of the pump both in the radial and the axial direction by means of said disc and an axial abutment means so that said gas separator is prevented from rotation

(d) an impeller formed separately from said disc and including an inlet, wherein said water outlet is secured to the casing wall by said axial abutment and is connected to said central opening, said central opening being connected to said impeller inlet with said gas separator being rigidly fixed in relation to said suction chamber by securing means at said water and gas outlets.

4,447,190

FLUID PRESSURE CONTROL IN A GAS TURBINE ENGINE

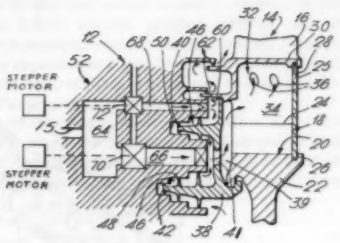
David A. Campbell, Borrowash, England, assignor to Rolls-Royce Limited, London, England

Filed Nov. 2, 1982, Ser. No. 438,632

Claims priority, application United Kingdom, Dec. 15, 1981, 8137691

Int. Cl.³ F01D *11/06*

U.S. Cl. 416—95 **7 Claims**



1. A gas turbine engine including a casing, a turbine stage comprising a disc having an upstream face and a rim and blades having shanks, a pair of annular lands adapted for co-rotation with said turbine stage, a pair of annular grooves in said casing for receipt of said annular lands, a first annular space to which cooling air is passed from between said lands, a further annular space radially outwardly of said first annular space, a plenum chamber for receipt of pressurized air, a pair of ducts communicating with said plenum chamber and with respective annular spaces and valve means in each duct and adapted for simultaneous operation to reduce flow of pressurized air in one duct and increase flow of pressurized air in the other duct.

4,447,191

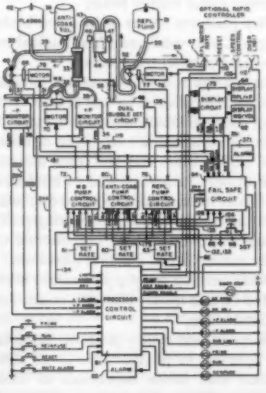
CONTROL CIRCUIT FOR A BLOOD FRACTIONATION APPARATUS

Arnold C. Bilstad, Deerfield, and John T. Foley, Wheeling, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 15, 1981, Ser. No. 330,898

Int. Cl.³ F04B *49/00*

U.S. Cl. 417—12 **9 Claims**



1. In a blood fractionation apparatus operable in conjunction with a disposable fluid flow system for separating and collecting a blood fraction from whole blood, and including at least

one motor-driven pump for conveying blood through the flow system, a tachometer associated with the motor, and a monitoring device providing an alarm signal in the presence of a fluid absence in the system, a failsafe control circuit comprising, in combination:

a flip-flop responsive to applied tachometer pulses from the pump motor for producing an alarm control signal;

a series-parallel counter having a reset input, a clock input and a series/parallel enable input, said counter requiring a predetermined number of applied clock pulses following application of a serial enabling signal for producing an output;

means for applying said flip-flop output signal to said parallel-serial enable input to enable said counter to a serial mode upon occurrence of said tach pulses;

means for applying said fluid absence alarm signal to said reset input to enable operation of said counter upon the occurrence of a fluid absence in the system;

means for applying clock pulses to said counter whereby said counter counts to zero over a predetermined time interval upon being conditioned to a serial mode at said serial-enable input and upon being enabled at said reset input; and

means responsive to the output of said counter for terminating operation of the pump.

4,447,192

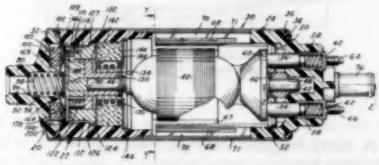
SELF-CONTAINED ROTARY FUEL PUMP

Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Division of Ser. No. 123,103, Feb. 19, 1980, Pat. No. 4,352,641. This application Jun. 24, 1982, Ser. No. 391,558

Int. Cl.³ F04B *35/04*; F04C *15/00*

U.S. Cl. 417—360 **2 Claims**



1. A power driven electric fuel pump comprising:

(a) an elongate housing having a fuel inlet at one end and a fuel outlet at the other end,

(b) a rotary pump body at the inlet end of the housing and a pump rotor in said pump body,

(c) a motor armature in said housing having a through shaft projecting from each end,

(d) means mounting said pump rotor on one end of said shaft within said pump body,

(e) means on the other end of said shaft for mounting said shaft in said housing having a spherical surface engaging a similar surface in said housing, and

(f) means mounting said one end of said shaft in said elongate housing including a portion of said rotary pump body tiltable in said elongate housing to permit alignment of said pump body, rotor and shaft in said elongate housing without distortion of said shaft.

4,447,193

COMPRESSOR UNLOADER APPARATUS

Stuart E. Bunn, and Herbert B. Owsely, both of Shawnee Mission, Kans., assignors to Ball Valve Co., Inc., Olathe, Kans.

Filed Jul. 20, 1981, Ser. No. 285,251

Int. Cl.³ F04B *41/00*

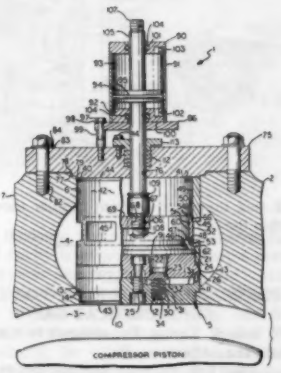
U.S. Cl. 417—441 **18 Claims**

1. An unloader apparatus for a gas compressor having a compressor cylinder, a reciprocating compressor piston slidably disposed therein, a suction chamber, and a suction valve having an inlet side communicating with said suction chamber and an outlet side communicating with said compressor cylinder, said unloader apparatus comprising:

(a) a sleeve positioned adjacent said suction valve inlet side, said sleeve having a central passage therethrough and a port for communicating gas from said suction chamber through said central passage to said suction valve inlet side;

(b) said sleeve having an annular shoulder projecting inwardly into said sleeve central passage, said annular shoulder having an upper surface;

(c) a slot encircling said sleeve central passage and opening upwardly onto said shoulder upper surface;



(d) an unloader piston having a central passage therethrough and positioned in said sleeve central passage and axially slidable with respect to said sleeve, said unloader piston being movable between an open position opening said port and a closed position closing said port;

(e) said unloader piston having a lower end extending downwardly into said slot with said unloader piston in said closed position;

(f) said unloader piston in said closed position blocking gas flow from said suction chamber to said suction valve and sealing said compressor cylinder; and

(g) actuator means for moving said unloader piston between said open and said closed positions.

4,447,194

METHOD OF MANUFACTURING A FUEL PUMP

Donald Worby, Kings Stanley, England, assignor to Lucas Industries Plc, Birmingham, England

Filed Jul. 6, 1982, Ser. No. 395,676

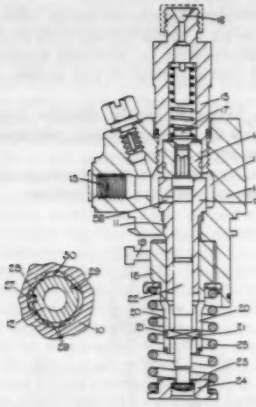
Claims priority, application United Kingdom, Jul. 21, 1981, 8122419

Int. Cl.³ F16J *10/02*; F02M *59/44*

U.S. Cl. 417—572 **5 Claims**

3. A fuel injection pump comprising a pump body, a cylindrical flanged pump barrel mounted within a bore in the body and a plunger reciprocably mounted within a further bore defined in the barrel, the pump barrel being retained against a step defined in the body by means of a part carried by the body which engages in sealing relationship, said bore having a noncircular form with at least three substantially flat sides for

engagement with the peripheral surface of the barrel, a longitudinal tongue in the bore and a groove on said barrel for engagement with said tongue to prevent angular movement of the barrel within the bore.

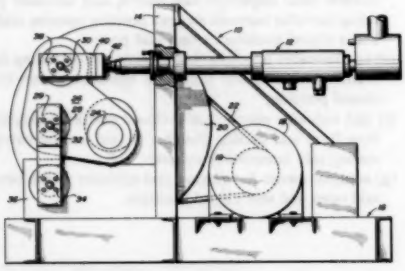


4,447,195

HIGH PRESSURE HELIUM PUMP FOR LIQUID OR SUPERCRITICAL GAS

Thomas W. Schuck, Easton, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 22, 1982, Ser. No. 350,914
Int. Cl.³ F04B *21/02*
U.S. Cl. 417—570 **5 Claims**



1. In a pump for compressing and transferring a cryogenic liquid from a storage receptacle of the type comprising a piston mounted for reciprocal movement inside a tubular housing communicating with said liquid, means to move said piston, means to permit movement of liquid from said receptacle to a variable pumping chamber in said tubular member during a portion of the stroke of said piston of said pump and means to discharge liquid from said pumping chamber through an outlet valve during the reverse portion of the stroke of said piston the improvement comprising:

a base plate mounted on a support frame for positioning said tubular housig containing a piston rod one end of which projects from said housing said projecting end positioned relative to a motor driven fly wheel containing thereon an eccentric; and

a four bar linkage disposed between said eccentric and the projecting end of said piston rod, said four bar linkage includes as its prime element a beam having at least three mounting points having centers disposed relative to each other at the apecies of a right triangle, said beam positioned by fixing the mounting point at the 90° apex to said frame by means of a rocker arm, and the mounting point at the other apecies to said eccentric and said piston rod respectively, said connection to said piston rod including a yoke; and

a piston of a hollow elongated structure extending substantially the length of said piston rod and mounted for reciprocation through a suitable aperture in said base plate said piston being sealed to said rod by means of a rigid boot;

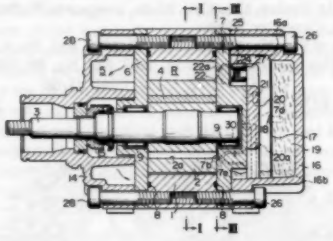
whereby rotation of said fly wheel causes said linkage to translate rotating motion of said fly wheel to nearly true straight line reciprocating motion of said piston rod so that said piston assembly travels through both the warm zone and cold zone packing with deviations from straight line motion being accommodated by elastic deformation of the piston rod.

4,447,196

ROTARY VANE COMPRESSOR WITH VALVE CONTROL OF UNDERVANE PRESSURE

Eiichi Nagasaku, Chiryu; Kimihiro Kato, and Masao Yasunaga, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 8, 1981, Ser. No. 271,382
Claims priority, application Japan, Feb. 16, 1981, 56-21706
Int. Cl.³ F04C *18/00, 29/02, 29/10*
U.S. Cl. 418—93 **8 Claims**



1. A rotary compressor for gas comprising:

a housing having an inner peripheral surface;

first and second end plates sealingly secured to the opposite ends of said housing to cooperate therewith to define a bore;

a rotor mounted eccentrically in said bore for rotation therein and provided with a plurality of vane grooves formed in the outer peripheral surface of said rotor;

vanes slidably mounted in said vane grooves, respectively;

said inner peripheral surface, said end plates, said rotor outer surface and said vanes cooperating to define a plurality of working chambers the volumes of which are varied during rotation of said rotor, each cycle of revolution of each working chamber about the axis of said rotor including intake and compression phases in which the volume of the working chamber is gradually expanded and gradually decreased, respectively;

an intake port means open to said bore and so disposed as to be communicated with the working chambers when they are in their intake phases;

a discharge port means open to said bore and so disposed as to be communicated with the working chambers when they are in the final stages of their compression phases;

means cooperating with one of said end plates to define a discharge chamber and a lubricant reservoir communicated therewith, said discharge chamber being communicated with said discharge port means, said lubricant reservoir being provided at the bottom of said discharge chamber and adapted to contain lubricant under the pressure of the compressed and discharged fluid in said discharge chamber;

said one end plate being provided with a lubricant groove formed in the surface thereof facing to said rotor, said lubricant groove being disposed such that the inner end portions of the vane grooves pertaining to vanes which define working chambers when in their intake phases are communicated with said lubricant groove;

means for guiding the lubricant under pressure from said reservoir into said lubricant groove;

said one end plate being also formed therein with a passage for the communication of said lubricant groove with the gas in said discharge chamber so that said lubricant groove and thus the inner end portions of respective vane grooves are supplied with fluid pressure from said discharge chamber;

valve means operative to interrupt the communication in said passage between said lubricant groove and said discharge chamber during normal compression operation of said compressor.

4,447,197

TIRE MOLD WITH AIR VENT INSERTS

Donald R. Bartley, Cuyahoga Falls, Ohio, and James M. Haase, Lansdale, Pa., assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jul. 25, 1983, Ser. No. 517,092
Int. Cl.³ B29H *5/02*
U.S. Cl. 425—28 R **4 Claims**

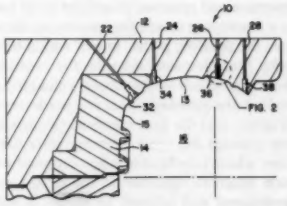


FIG. 2

1. A tire mold having a mold cavity and at least one vent hole of selected diameter extending from said cavity to the exterior of said mold, a cylindrical insert disposed within said vent hole and having an opening therethrough of diameter less than the said selected vent hole diameter, said insert being of a low friction plastic material having a coefficient of thermal expansion less than 8×10^{-5} in/in/°C. and a heat distortion temperature at 66 psi when measured in accordance with ASTM D648 of no less than 275° F.

4,447,198

HYDRAULIC REFRACTORY PRESS INCLUDING PRODUCT THICKNESS OR DENSITY CONTROL MEANS

Gary R. Long, Bolingbrook, and Robert J. Dorsey, Chicago, both of Ill., assignors to Wehr Corporation, Milwaukee, Wis.

Filed Oct. 26, 1982, Ser. No. 436,699
Int. Cl.³ B30B *15/16*
U.S. Cl. 425—140 **18 Claims**

1. A hydraulic press comprising:

a frame,

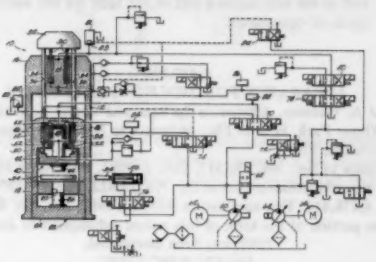
a mold box supported by said frame, said mold box including at least one vertically extending mold cavity,

a lower plunger assembly positioned below said mold box and including a plunger adapted to extend upwardly into said mold cavity,

an upper plunger assembly positioned above said mold box and including a plunger adapted to extend downwardly into said mold cavity,

means for causing selective vertical movement of said upper plunger assembly with respect to said mold box and said lower plunger assembly, said means for causing selective movement of said upper plunger assembly including a ram and a cylinder,

means for controlling movement of said upper plunger assembly and said lower plunger assembly with respect to said mold box and with respect to each other, said means for controlling movement of said upper plunger assembly and said lower plunger assembly including means for causing movement of said plunger assemblies selectively and alternatively to a position wherein there is a selected space between said plunger assemblies whereby a compressed material product produced by said press will have



a selected thickness, and to a position wherein material in said mold cavity is subjected to a selected pressure between said upper plunger assembly and said lower plunger assembly whereby a compressed product produced by said press will have a selected density, said means for controlling movement including,

means for sensing the relative movement of said lower plunger assembly and said upper plunger assembly, said means for sensing including means for generating a signal indicating the relative position of said upper plunger assembly and said lower plunger assembly, and

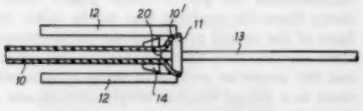
means for sensing the pressure in said cylinder.

4,447,199

APPARATUS FOR MAKING THERMOPLASTICS ARTICLES

Leonard W. Reed, Wantage; Robert M. S. Barr, Faringdon, and David A. Dick, Wantage, all of England, assignors to Metal Box Limited, Reading, England

Filed Nov. 17, 1981, Ser. No. 322,380
Claims priority, application United Kingdom, Nov. 19, 1980, 8037137
Int. Cl.³ B29C *17/02, 17/07, 17/14*
U.S. Cl. 425—182 **20 Claims**



1. Apparatus for forming a plurality of at least partly biaxially oriented tubular articles from a common elongate tube of polymeric/copolymeric thermoplastics material by a repeated cycle of operations, which comprises

a first clamping means for clampingly engaging a leading end of the tube over a first clamping region,

a second clamping means for clampingly engaging the tube on its outside and sealingly on its inside over a second clamping region which is at a spacing from the first clamping region and is intermediate the tube length, while maintaining the tube in an open condition at said second clamping region, the first and second clamping means being relatively reciprocable longitudinally of the tube,

stretch means to move the clamping means apart with the tube clampingly engaged thereby so as to longitudinally to stretch the portion of the tube lying between the clamping regions,

fluid pressure means operable to supply pressure fluid to the interior of the tube portion so as to expand it radially, such stretching and radial expansion forming a bubble of biaxially oriented polymeric/copolymeric thermoplastics material adjacent the leading end of the tube, and

severance means operable to sever at least a substantial part of the bubble from the tube to form the tube with a new end as the said leading end of the tube for the succeeding cycle of operations.

4,447,200

APPARATUS FOR MOLDING SKYLIGHTS

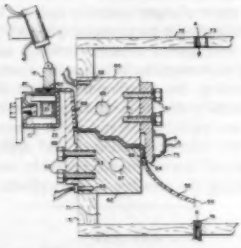
Kent A. Weisner, Altamonte Springs, and Lester L. Walls, Jr., Winter Park, both of Fla., assignors to Kenergy Corporation, Orlando, Fla.

Division of Ser. No. 230,317, Feb. 2, 1981, Pat. No. 4,352,776, and a continuation-in-part of Ser. No. 12,822, Feb. 16, 1979, Pat. No. 4,278,414. This application Nov. 12, 1982, Ser. No. 431,287

The portion of the term of this patent subsequent to Jul. 14, 1998, has been disclaimed.

Int. Cl.³ B29C *17/00*

U.S. Cl. 425—388 **7 Claims**



5. Apparatus for molding and forming polycarbonate plastic sheet into dome elements for a skylight comprising:

a loading station having an adjustable clamp frame for clamping the perimeter of a polycarbonate plastic sheet;

a first electrical heating element in thermal contact with said clamp frame so as to heat the entire perimeter portion of the clamped polycarbonate plastic sheet to a first selected temperature;

a heating station having upper and lower ovens for receiving therebetween the polycarbonate plastic sheet in said clamp frame for applying heat to the upper and lower faces of the central portion of the polycarbonate plastic sheet and the clamp frame for heating the central portion and the perimeter portion of the polycarbonate plastic sheet to a second selected temperature greater than the first temperature; and

a molding station for receiving the clamp frame having the heated polycarbonate plastic sheet clamped therein from said heating station, said molding station having one of a pair of co-acting molds disposed above and one of said pair disposed below the polycarbonate sheet, said molds each having a second electrical heating element in thermal contact therewith for heating said molds to a temperature within the range of the first and second temperatures, said co-acting molds adapted to produce step shapes within the perimeter of the polycarbonate sheet when said pair is closed, and a vacuum box connected at one of said pair of co-acting molds for introduction of a vacuum therein for forming a dome portion in the central portion of the polycarbonate plastic sheet.

4,447,201

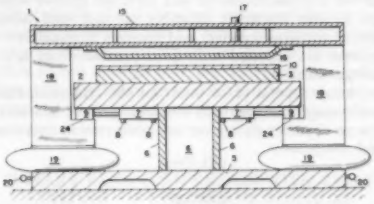
VULCANIZING PRESS FOR VULCANIZING FLAT ARTICLES

Poul H. Knudsen, Beder, Denmark, assignor to Clean-Tex A/S, Morke, Denmark

Filed Jun. 29, 1981, Ser. No. 278,572

Int. Cl.³ B28B *11/00, 7/32;* B29C *17/00, 17/06*

U.S. Cl. 425—397 **6 Claims**



1. A vulcanizing press for vulcanizing flat articles such as rubber backings on textile mats, and of the type consisting of a lower pressing plate, an upper pressing plate, which plates are mutually displaceable against and away from each other, a press frame which supports one of the pressing plates, guides and driving means for the movement of the other pressing plate between a closed vulcanizing position and an open position for insertion and removal of articles to be vulcanized, and optionally a conveying means for conveying the articles in and out between the pressing plates, one of which being adapted to be heated by heat elements, wherein the pressing plates have locking members which in the closed vulcanizing position are adapted to lock the pressing plates at a predetermined distance from each other, and the heat elementless pressing plate on its side turned towards the other pressing plate carries an inflatable member which is inflatable when supplied with a pressure fluid, which inflatable member in the closed position of the press is positioned and inflated to supply a uniform surface pressure substantially over the whole flat side of an article placed between the pressing plates.

4,447,202

DEVICE FOR THE PREPARATION OF HOLLOW CONFECTIONERY PARTS

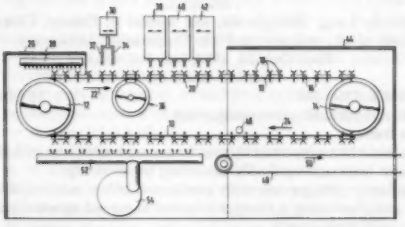
Lutz-Erdmut Adolf, Bielefeld, and Klaus Oberwelland, Steinhagen, both of Fed. Rep. of Germany, assignors to August Stork KG, Halle/Westfalen, Fed. Rep. of Germany

Filed Jan. 19, 1982, Ser. No. 340,757

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1981, 3101442

Int. Cl.³ B29C *5/04;* B29F *5/00;* A23G *1/21, 3/12*

U.S. Cl. 425—434 **16 Claims**



1. An apparatus for the production of hollow confectionery parts, comprising:

an endless conveyor;

a plurality of cup-shaped centrifugal molds, successively arranged for rotation on said conveyor, each of said molds

being open at the top and having a drive cog comprising the lower portion thereof;

a first feeder device positioned above said centrifugal molds for supplying confectionery materials to said centrifugal molds; and

a drive means for selectively and intermittently rotating said centrifugal molds, wherein said drive means comprises a drive element located laterally in relation to said drive cogs and moving in a stationary path, the location of said drive element being such that it successively frictionally engages said drive cogs of said centrigugal molds during the movement of said conveyor, wherein said cogs have conical frictional driving surface and said driving means has an inclined frictional driving surface for mating with said conical frictional driving surfaces.

4,447,203

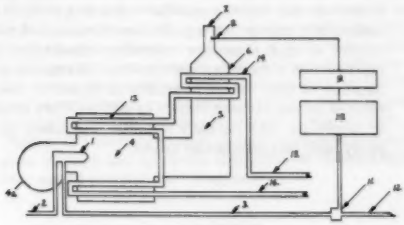
FLAME COMBUSTION OF CARBONACEOUS FUELS

William J. Hampton; Glenn R. James, both of 101 Adkisson Way, and Raymond L. Hatch, 209 E. Warren St., all of Taft, Calif. 93268

Continuation of Ser. No. 211,347, Nov. 28, 1980, abandoned, which is a continuation-in-part of Ser. No. 956,434, Oct. 31, 1978. This application Aug. 22, 1983, Ser. No. 525,421

Int. Cl.³ F23J *7/00*

U.S. Cl. 431—3 **25 Claims**



1. The method of reducing the production of nitrogen oxides in a flame combustion process utilizing carbonaceous fuel and combustion air, comprising: bringing said fuel and air together in a combustible ratio, and maintaining a flame for combustion of said fuel, and supplying an additive so that said additive is uniformly present at the situs of said combustion, said additive comprising one or more ionic compounds of sodium or one or more ionic compounds of potassium, or mixtures thereof, in amounts which reduce the NO_x generated in said combustion below the amount produced without said additive being present, said additive being uniformly and intimately pre-mixed, prior to introduction into the region where combustion occurs, throughout all of the fuel, or throughout all of such of said air as is provided to the fuel where combustion begins, or throughout both.

4,447,204

COMBUSTION CONTROL WITH FLAMES

Arnold O. Isenberg, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 10, 1982, Ser. No. 387,295

Int. Cl.³ F23N *5/00*

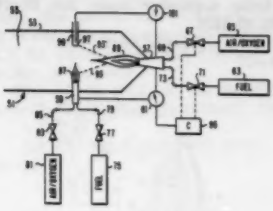
U.S. Cl. 431—76 **5 Claims**

1. A process for detecting the relative oxygen content of the combustion products from a flame fed by an undetermined air-fuel ratio comprising the steps of:

(a) providing an electrically insulated first nozzle means for the generation of said flame being fed by an undetermined air-fuel ratio, said flame consisting in part of ionized gases and said nozzle means being electrically conductive;

(b) establishing an ionic interface between the ionized gases of said flame and a second electrically insulated source of oxygen ion conductive material;

(c) measuring the potential difference between said electrically insulated first nozzle means and said second electri-



cally isolated source of oxygen ion conductive material, said potential difference reflecting changes in the combustion condition of said flame, that is, lean to rich and rich to lean combustion conditions.

4,447,205

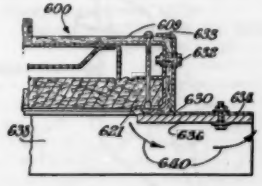
INFRA-RED EQUIPMENT AND USE

Thomas M. Smith, 114 Villinger Ave., Cinnaminson, N.J. 08077

Continuation-in-part of Ser. No. 186,491, Sep. 12, 1980, Pat. No. 4,378,207, and a continuation-in-part of Ser. No. 178,121, Aug. 14, 1980, Pat. No. 4,373,904, and a continuation-in-part of Ser. No. 94,901, Nov. 16, 1979, Pat. No. 4,272,238, and a continuation-in-part of Ser. No. 20,079, Mar. 13, 1979, Pat. No. 4,290,746, and a continuation-in-part of Ser. No. 952,332, Oct. 18, 1978, Pat. No. 4,326,843, and a continuation-in-part of Ser. No. 775,838, Mar. 9, 1977, Pat. No. 4,272,237, said Ser. No. 186,491, said Ser. No. 178,121, said Ser. No. 94,901 and said Ser. No. 20,079, and is a continuation-in-part of Ser. No. 863,251 and Dec. 22, 1977, Pat. No. 4,224,018, said Ser. No. 20,079, said Ser. No. 952,332, is a continuation-in-part of Ser. No. 906,229, May 15, 1978, Pat. No. 4,157,155, said Ser. No. 906,229, said Ser. No. 863,251, said Ser. No. 775,838, is a continuation-in-part of Ser. No. 701,687, Jul. 1, 1976, abandoned, said Ser. No. 775,838, is a continuation-in-part of Ser. No. 674,409, Apr. 7, 1976, Pat. No. 4,035,132. This application Feb. 26, 1981, Ser. No. 238,418

Int. Cl.³ F23D *13/12*

U.S. Cl. 431—328 **5 Claims**



1. In a gas-fired infra-red-generating burner having a ceramic fiber matrix on a surface of which the burning of the gas takes place while the matrix is clamped in place by at least one metal hold-down flange pressed in squeezing engagement against the margins of that surface and having a width extending from the matrix edges to a location inboard of those edges, the improvement according to which about 1 to about 5 millimeters of the flange width at the inboard edge of said flange is curled away from the balance of the flange width to relieve the flange edge engagement with the matrix.

4,447,206

DEVICE AND METHOD FOR DETECTING APICAL CONSTRICTION IN ROOT CANAL OF TOOTH

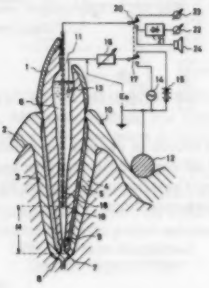
Junji Ushiyama, 5829-761, Kamishin-ei-cho, Niigata-shi, Niigata-ken, Japan

Filed Dec. 30, 1982, Ser. No. 454,873

Claims priority, application Japan, Jan. 18, 1982, 57-6420; Jan. 18, 1982, 57-6421

Int. Cl.³ A61C *3/00*

U.S. Cl. 433—27 **9 Claims**



1. A device for detecting the apical constriction in the root canal of a tooth having an electrolyte therein, comprising first electrode means for contacting the mucous membrane in the oral cavity, said first electrode means being coupled to a reference potential point, second electrode means for inserting in said root canal, means coupled to said first and second electrode means for applying a fixed voltage or current therebetween, third electrode means for inserting movably into said root canal, and means coupled to said third electrode means for detecting the potential gradient along said root canal.

4,447,207

MANDIBULAR MOTION DIAGNOSTIC DEVICE

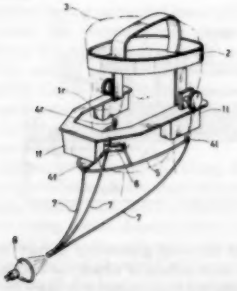
Kenzo Kataoka; Shinichi Nishimoto, both of Otsu, and Kazunari Matoba, Nara, all of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Apr. 6, 1983, Ser. No. 482,636

Claims priority, application Japan, Apr. 7, 1982, 57-57721

Int. Cl.³ A61C *19/04*

U.S. Cl. 433—69 **3 Claims**



1. A mandibular motion diagnostic device comprising:

a mandibular motion measuring unit including:

a head band for a patient;

at least three position detectors coupled to said head band, each of said position detectors being provided at predetermined points to be measured and having a fixed position relative to a mandible of said patient, each of said position detectors comprising:

a linear photo-electric conversion element;

a screening plate disposed in front of said linear photo-electric conversion element; and

at least two slits provided in said screening plate; and

a clutch for being coupled to said mandible of said patient;

a loop bar coupled to said clutch and extending around said mandible;

at least three light sources provided on said loop bar in a single plane and adjacent said position detectors, said three light sources comprising:

at least three photo-fibers, one each extending to a point adjacent said position detectors; and

a single source of light for supplying light to said photo-fibers; and

whereby the movement of said each point to be measured is detected as position information as a function of time; and

a mandibular motion reproducing unit including:

three reference points for reproducing their relative positions with respect to a mandibular model equal to said relative positions of each point to be measured with respect to said patient's mandible; and

three reference coordinates for reproducing their relative positions with respect to maxillary model equal to said relative positions of individual position detectors with respect to said patient's maxilla so that said position of each reference point for reproduction is controlled with respect to said respective reference coordinates for reproduction according to said position information as a function of time for said mandibular model to cause relative movement with respect to said maxillary model to reproduce said patient's mandible movement precisely with said mandibular model.

4,447,208

DENTAL POLISHER

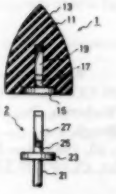
Masakatsu Kawai, Kashihara, Japan, assignor to Shofu, Inc., Kyoto, Japan

Filed Apr. 11, 1983, Ser. No. 483,839

Claims priority, application Japan, Apr. 23, 1982, 57-68964

Int. Cl.³ A61C *3/06*

U.S. Cl. 433—166 **6 Claims**



1. A dental polisher, comprising a resilient, flexible body made of rubber or synthetic resin, and a rotating shaft coupled to said body, said body having a first polyurethane layer deposited on the surface of said body, a second epoxy adhesive layer deposited on said first layer, abrasive particles scattered on said second layer and a third adhesive layer deposited on said second layer and over said abrasive particles.

4,447,209

IMPLANT FOR SECURING A DENTURE

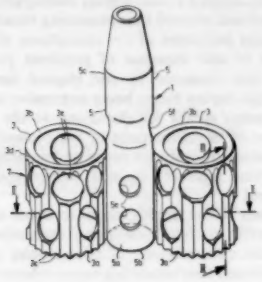
Franz Sutter, Niederdorf, Switzerland, assignor to Institut Straumann AG, Switzerland

Filed Nov. 6, 1981, Ser. No. 319,080

Claims priority, application Switzerland, Aug. 20, 1981, 5375/81

Int. Cl.³ A61C 8/00

U.S. Cl. 433—173 25 Claims



1. An implant for securing a denture to a jawbone comprising a base to be inserted into an annular groove of the bone and at least one column for supporting the denture, said base including at least two hollow, substantially cylindrical parts each having an inner diameter and open at both ends to the same extent as said inner diameter, said hollow substantially cylindrical parts each having a substantially cylindrical wall with at least one of recesses and elevations which extend along straight lines parallel to the longitudinal axis of the column, and a plurality of apertures defined therethrough, whereby bone can grow through said apertures, said aperures intersecting said at least one of recesses and elevations.

4,447,210

UPPER STRUCTURE FOR ARTIFICIAL APATITE DENTAL ROOT

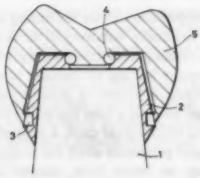
Tsuneo Hidaka; Masahide Inoue, and Makoto Ogiso, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1982, Ser. No. 450,156

Claims priority, application Japan, Dec. 17, 1981, 56-204134

Int. Cl.³ A61C 8/00

U.S. Cl. 433—173 3 Claims



1. An upper structure for an artificial apatite dental root comprising an inner crown having a lower skirt portion and an upper central recess adapted to be fixedly secured to said root, an outer crown having a lower portion adapted to overlie said skirt portion in spaced relation thereto and a downwardly extending projection adapted to extend into said central recess, an annular groove formed in the lower end of said skirt portion of said inner crown, a first annular elastic member secured in said groove with the lower end of said outer crown disposed in contact with said first elastic member, opposed grooves formed in said central recess of said inner crown and said projection of said outer crown and a second annular elastic member disposed in said opposed grooves whereby said first and second elastic members support said outer crown in spaced relation to said inner crown.

4,447,211

SIMULATED PORTABLE ROCKET LAUNCHER

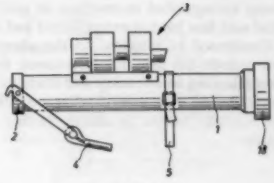
Bernd M. Kern, Stuveaborn, and Werner Hasse, Neu Wulmstorf, both of Fed. Rep. of Germany, assignors to Precitronic Gesellschaft fur Feinmechanik und Electronic mbH, Hamburg, Fed. Rep. of Germany

Filed Jul. 12, 1982, Ser. No. 397,502

Claims priority, application Switzerland, Dec. 2, 1981, 7716/81

Int. Cl.³ G09B 9/00; F41F 27/00

U.S. Cl. 434—12 5 Claims



1. A portable apparatus having the shape of a rocket launcher and adapted to be used in conjunction with a laser aiming device, which comprises: a tubular casing adapted to have removably inserted therein a unit of similar shape, said unit comprising front and rear end plates and a gliding rod extending axially therebetween; an annular-shaped mass body mounted on said gliding rod extending through its annulus and adapted to move therealong between said front and rear end plates; a compression spring surrounding said gliding rod extending between said mass body and said rear end plate; a resilient stop member positioned at said front end plate; means for securing said mass body under the compressive force of said spring to said rear end plate; and triggering means for releasing said mass body from said rear end plate thereby propelling it under the force of said spring along said gliding rod toward said front end plate, said stop means terminating the movement and absorbing the force of said mass body.

4,447,212

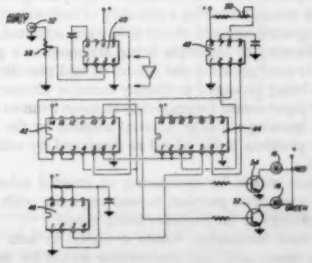
VERBAL RESPONSE TIME CONDITIONING APPARATUS

John N. Swift, R.D. 3, Box 146, Oswego, N.Y. 13126, and Harry M. Hawkins, R.D. 2, Box 61, Oswego, N.Y., assignors to J. Nathan Swift, Oswego, N.Y. 13126

Filed Apr. 8, 1982, Ser. No. 366,630

Int. Cl.³ G09B 21/00

U.S. Cl. 434—185 12 Claims



1. A conditioning device for use in a classroom wherein

verbal statements, questions and responses are exchanged between teacher and students, said device comprising:

(a) a single audio input means for receiving verbalized sounds from said teacher and students at or above a predetermined sound level and operable to generate a first electrical signal in response thereto;

(b) first and second electric lamps positioned for observation by all of said teacher and students;

(c) power supply means operable to illuminate said first and second lamps when connected thereto;

(d) timing means operable to generate a second electrical signal in response to the absence of said first signal for a predetermined time period; and

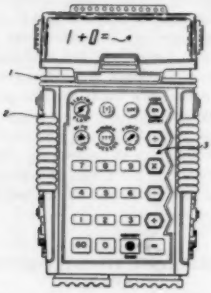
(e) switching means operable to connect said power supply means only to said first lamp in response to said first signal and only to said second lamp in response to said second signal, whereby said first lamp is illuminated and said second lamp extinguished in response to said verbalized sounds, and said first lamp is extinguished and said second lamp is illuminated in response to the absence of said verbalized sounds for said predetermined time period, thereby conditioning said teacher and students to wait for said predetermined time period after cessation of said verbalized sounds before resuming further classroom verbalization.

4,447,213

ELECTRONIC LEARNING AID

Bobby G. Culley, Wylie, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 17, 1977, Ser. No. 843,017
Int. Cl.³ G09B *23/02*
U.S. Cl. 434—201 **16 Claims**



1. An electronic learning aid comprising:

problem posing means for posing a sequence of arithmetic problems to an operator of the learning aid;

display means operably associated with said problem posing means for visually presenting to an operator of the learning aid problems posed by said problem posing means, said display means including a plurality of individually actuatable segments visually observable when actuated, some of said plurality of segments being arranged in a generally circular configuration and others of said plurality of segments being arranged to display numeric characters;

operator input means for receiving an input from an operator of the learning aid as an entered solution by the operator to the problem being posed as displayed by said display means;

comparison means for comparing an entered solution to a posed arithmetic problem in said sequence with the correct solution to the problem being posed;

elasped time measuring means coupled to said problem posing means and said comparison means for measuring elapsed times between the time the first problem in said sequence is posed until the time the last problem in said sequence is solved, said elapsed time measuring means including a register for storing a number indicative of the elapsed time;

an arithmetic unit associated with said problem posing means, said comparison means and said elapsed time measuring means for calculating the correct solutions to the problems posed and for periodically incrementing the number stored in said register of said elapsed time measuring means;

result means coupled to said display means, said comparison means and said elapsed time measuring means for providing outputs indicative of the correctness of the entered solutions of said sequence of problems posed and the elapsed time measured by said elapsed time measuring means, said display means being responsive to the outputs of said result means for displaying to the operator an indication of the correctness of the entered solutions of said sequence of problems posed and an indication of the elapsed time measured by said elapsed time measuring means; and

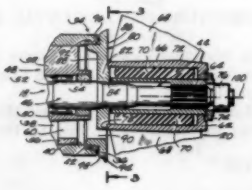
said segments of said display means arranged in said generally circular configuration being sequentially actuated around the circumference of said circular configuration by said elapsed time measuring means wherever said problem posing means poses a sequence of problems at said display means, and said other segments arranged to display numeric characters being selectively actuatable in response to said elapsed time measuring means to display numeric characters indicative of the total elapsed time measured by said elapsed time measuring means.

4,447,214

ANTI-VENTILATION MEANS FOR MARINE GEAR CASE

Donald A. Henrich, Lake Villa, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 11, 1982, Ser. No. 348,035
Int. Cl.³ B63H *1/20*
U.S. Cl. 440—66 **3 Claims**



1. A marine propulsion device including a lower unit including a gear case normally submerged in water and having an outer surface, a trailing end terminating in a trailing surface, and a hollow interior having an annular inner surface adjacent said trailing surface, a propeller shaft rotatably supported in said gear case and having a rear portion extending rearwardly of the trailing end of said gear case, a propeller mounted on the rear portion of said propeller shaft for common rotation therewith and having an outer hub, means defining a passage through which engine exhaust gases are discharged rearwardly from said interior of said gear case into the water exteriorly of said outer propeller hub, a ring member having a central hub mounted on said propeller shaft for common rotation therewith, a plurality of circumferentially-spaced ribs extending radially from said central hub, and an annular collar connected to said ribs and including an annular outer surface extending closely adjacent said annular inner surface of said gear case, and an annular section on said collar located rearwardly of said annular outer surface and rearwardly of said trailing surface of said gear case, said section having an outer surface tapering radially outwardly from the outer surface of said gear case towards said propeller so as to prevent migration forwardly

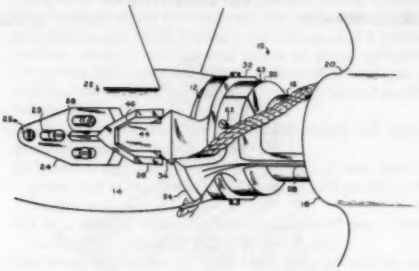
along the outer surface of said gear case of engine exhaust gases discharged from said gear case.

4,447,215

PROPELLOR PROTECTING DEVICES

Donald T. Govan, P.O. Box 3277 Bahia Mar, Ft. Lauderdale, Fla. 33316

Filed Jul. 6, 1982, Ser. No. 395,859
Int. Cl.³ B63H 5/16
U.S. Cl. 440—71 **9 Claims**



1. A device for cutting lines and nets, that float on the surface of water and lines and nets that are disposed in substantially upstanding relation beneath the surface of water, so that such lines and nets do not foul the propellers, shafts, and bearings of propeller driven vessels, comprising, in combination,

a base means defined by a pair of diametrically opposed base members that are fixedly secured to a keel of a vessel,

said base members having a rearward opening wedge-shaped portion,

an annular, non-rotatable first shearing means adapted for mounting about a propeller shaft means,

said first shearing means having diametrically opposed first cutting blade members disposed in registration with said diametrically opposed base members,

said first cutting blade members having a forward extending wedge-shaped portion adapted for wedging engagement with the rearward opening wedge-shaped portion of said base members,

an annular, rotatable second shearing means fixedly secured to and conjointly rotatable with said propeller shaft, having diametrically opposed second cutting blade members disposed in cooperative relation to said first cutting blade members so that lines and nets are sheared by said first and second shearing means attendant rotation of said second shearing means relative to said first shearing means, longitudinal separation of said first and second shearing members being substantially prevented by the wedging relationship between said base members and said first shearing means,

said second shearing means further comprising an annular, square-in-section channel means within which said first shearing means is rotatably mounted, said channel serving to prevent longitudinal separation of said first and second shearing means.

4,447,216

STEM SEALING APPARATUS HAVING EXTERNAL TIPPING OFF BURNERS

Takeshi Moriwaki, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

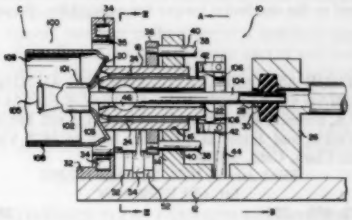
Filed Mar. 25, 1982, Ser. No. 361,618
Claims priority, application Japan, Mar. 31, 1981, 56-48029
Int. Cl.³ H01J 9/34, 9/40
U.S. Cl. 445—70 **15 Claims**

1. In an apparatus for manufacturing bulbs each of which includes a bulb body having at least one opening edge defining an opening, and a mount contacted and sealed to the opening edge of the bulb body, the mount having a stem, an exhaust tube led out from the stem, a pair of lead wires led out from the stem, and a filament coil attached to the lead wires, comprising:

a mount holder for holding the mount, the mount holder having a pair of lead wire insertion holes through which the lead wires are passed severally, and an exhaust tube insertion hole through which the exhaust tube is passed;

a sealing burner arranged around the mount holder, and capable of fusing the contact portions of the periphery of said stem and the opening edge of the bulb body;

a butting plate arranged around the mount holder to be able to move along the axis of the mount holder toward the bulb, and capable of abutting on and pressing the fused contact portions of the stem and the bulb body; and



a tipping-off means injecting flames toward a portion of the exhaust tube located inside the exhaust tube insertion hole to heat the portion,

the improvement in which

said mount holder includes at least one flame inlet port opening in the outer surface of the mount holder and communicating with the exhaust tube insertion hole, and

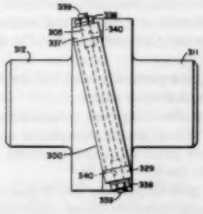
said tipping-off means includes a tipping-off burner which is located outside of the mount holder and can move between a position where the tipping-off burner is closed enough to the mount holder to inject flames into the flame inlet port and a position where the tipping-off burner is kept away from the mount holder so as not a prevent the movement of the butting plate.

4,447,217

COUPLING WITH OVERLOAD PROTECTION

Stephen Blandford, 24 Lawrence Rd., Marsh, Huddersfield, England

Filed May 14, 1981, Ser. No. 263,799
Claims priority, application United Kingdom, May 16, 1980, 8016195
Int. Cl.³ F16D 9/00
U.S. Cl. 464—32 **1 Claim**



1. An overload protection coupling for limiting the torque transmitted between two elements of a rotating power transmission system, said coupling comprising:

coaxial driving and driven members journaled for rotation relative to one another;

at least one tensile breaking piece positioned on the periphery of the overload protection coupling and comprising an elongated rod whose two ends are connected to respective projections on the driving and driven members, at least one end of the rod being screw threaded and carrying an adjustable nut enabling the projections on the driving and driven members to be displaced towards one another thereby urging relative rotation in a first direction; and,

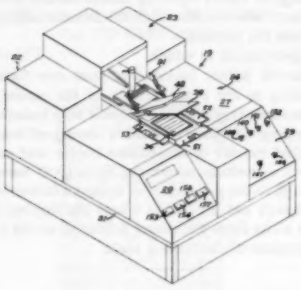
a pretension means also positioned on the periphery of the overload protection coupling and comprising a tube disposed around each elongated rod and whose two ends abut the projections on the driving and driven members respectively to resist said displacement of the projections upon tightening of said adjustable nut thereby placing said tube in compression and pretension said tensile breaking piece up to a given level which is approximately equivalent to the maximum torque transmitted by said coupling.

4,447,218

METHOD AND APPARATUS FOR THE AUTOMATIC FOLDING OF FLOPPY DISC STORAGE ENVELOPES

Dieter A. Bertsch, 940 Auburn Ct., Fremont, Calif. 94538; Mark A. Finkle, and James D. Fishman, both of 3475 Victor St., Santa Clara, Calif. 95050

Filed Jan. 6, 1981, Ser. No. 222,897
Int. Cl.³ B32B *3/04*
U.S. Cl. 493—251 **28 Claims**



20. Apparatus for automatically forming a pre-cut flat sheet blank of polyvinyl chloride or paper into an envelope having three closed edges and one open edge for the storage of floppy discs on which data is recorded, comprising:

(a) a support base;

(b) an envelope-forming assembly supported on the support base and including:

(1) a platen for receiving said flat sheet blank;

(2) a tongue plate pivotally mounted for selective impingement with said platen and normally spaced therefrom to permit placement of said flat sheet blank on said platen;

(3) a clamp plate pivotally mounted for selective impingement on said tongue plate;

(4) a plurality of folding bars associated adjacent front, left and right side edges of said platen and selectively pivotal to fold predetermined portions of said flat sheet blank upon itself;

(5) a pair of glue dispensing heads spaced apart to overlie marginal edge portions of an underlying flat sheet blank clamped on said platen and selectively reciprocable between a retracted position and an extended position in which said glue dispensing heads overlie said marginal edge portions of the blank; and

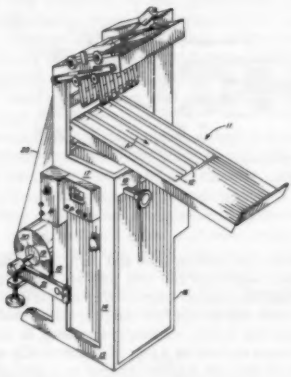
(c) computer means including a microprocessor, a programmable read-only memory section, a random access memory section and input/output circuits connected to said envelope forming assembly to control the operating functions thereof and the sequencing of performance of said functions.

4,447,219

DELIVERY MECHANISM FOR PAPER SHEET PROCESSING APPARATUS

Earnest B. Bunch, Jr., 9619 N. 21st Dr., Phoenix, Ariz. 85021

Continuation-in-part of Ser. No. 412,392, Aug. 30, 1982. This application Mar. 10, 1983, Ser. No. 474,186
Int. Cl.³ B65H *45/20*
U.S. Cl. 493—410 **2 Claims**



1. In combination with apparatus for producing continuous form stationery by folding a strip of paper along transverse lines of weakening formed therein, said apparatus including:

a frame;

primary endless belt means mounted on said frame for alternately distributing said transverse lines of weakening in said paper in substantially opposite lateral directions of travel to form creased edges in said paper along said lines of weakening, said belt means including

a pair of spaced adjacent parallelably disposed paper distribution rollers, each of said rollers having

a generally constant diameter along the length thereof, and

a longitudinal axis about which said rollers rotate; and

belts trained around said distribution rollers to form laterally extending conveyor runs with the belts and rollers cooperatively forming a passage between the distributing rollers to allow the paper strip to be fed through the passage; said belts having two runs which move in opposite directions to propel said strip in said opposite lateral directions;

means carried on said frame for directing said continuous strip of paper to said passage and into contact with at least some of said belts for said lateral distribution in said substantially opposite directions, said lateral distribution directions being generally perpendicular to said longitudinal axes of said distribution rollers,

delivery means for receiving paper distribution by said primary endless belt means, said delivery means including

(a) first endless belt means including at least one moving endless belt having an outer peripheral surface including outwardly projecting feet connected to and spaced therealong; and

(b) second endless belt means spaced apart from and in generally opposed, parallel relation to said first endless belt means by a distance approximately equal to the length of paper strip between two transverse lines of weakening, said second endless belt means including at least one moving endless belt having an outer peripheral surface includ-

ing outwardly projecting feet connected to and spaced therealong,

said first and second endless belt means being positioned on said frame to respectively extend away from a position adjacent said two runs of said belts and being operatively associated with said primary endless belt means

(c) to receive therebetween paper distributed by said primary belt means and carry said distributed paper away from said primary belt means;

(d) to cooperate with said primary belt means to fold said distributed paper along selected ones of said lines of weakening to produce a zig-zag stack of paper having a plurality of creased edges between said first and second endless belt means, said stack having a top portion and a bottom portion, each of said creased edges of paper generally contacting said outer peripheral surface of at least one of said endless belts carried by said first and second endless belt means,

(e) such that paper distributed by said primary belt means generally initially moves

(i) between and contacts said top portion of said stack of paper and at least one of said belts of said primary belt means, and

(ii) in a general direction of travel toward one of said endless belt means of said delivery means,

while being distributed on said top portion of said zig-zag stack of paper to form said creased edges contacting said endless belts of said endless belt means of said delivery means, said movement of said distributed paper between said top portion of said stack of zig-zag paper and said belts of said primary belt means controlling said movement of said paper and facilitating the folding of lightweight paper by said apparatus,

said feet being shaped, contoured and dimensioned to maintain each of said creased edges of said zig-zag stack of paper contacting said outer peripheral surface of one of said endless belts in a generally fixed position with respect to said outer peripheral surface of said endless belt.

4,447,220

METHOD AND APPARATUS FOR SEPARATING BLOOD COMPONENTS

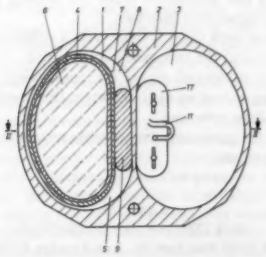
Günter Eberle, Gartenstrasse 100, 7200 Tuttlingen, Fed. Rep. of Germany

Filed Sep. 22, 1980, Ser. No. 186,482

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1979, 2938367; Nov. 15, 1979, 2946198; Apr. 1, 1980, 3012708

Int. Cl.³ B04B *15/06, 15/12*

U.S. Cl. 494—26 **3 Claims**



1. A centrifuge for the separation of blood components which comprises:

A. a rotor;

B. a plurality of expandable blood bags disposed in said rotor for rotation therewith, said blood bags comprising:

1. a first series of blood bags, each bag of said series being adapted for holding an amount of whole blood,

2. a second series of blood bags, equal in number to the number of blood bags of said first series, each bag of said series being adapted to receive a separated blood component from one of the bags of said first series;

C. a plurality of connecting tubes, equal in number to the number of bags of said first series, one of each of said tubes being connected to one bag of each said first and second series, so as to define a flow path between each bag of said first series and a corresponding bag of said second series;

D. fluid pressure responsive displacement bodies, said bodies being adapted to be placed between blood bags of said first series;

E. fluid pressure means for expanding said fluid pressure responsive displacement body during operation of the centrifuge, and thus simultaneously squeeze a controlled amount of liquid from the two blood bags;

F. a series of partitions projecting radially from the axis of rotation of said rotor, and defining a series of expandable pie-shaped chambers;

G. a support member, in the form of a modified trapezoid (**34**, FIG. **6**), for insertion between two of said radiating partitions and in direct contact with the said fluid pressure responsive displacement body so that expansion of said displacement body applies radial pressure against said support member and against two of the blood bags of the first series disposed in adjacent pie-shaped chambers.

4,447,221

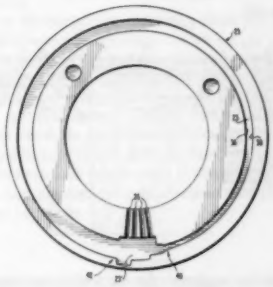
CONTINUOUS FLOW CENTRIFUGE ASSEMBLY

Alfred P. Mulzet, Princeton Jct., N.J., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 15, 1982, Ser. No. 388,770

Int. Cl.³ B04B *7/08*

U.S. Cl. 494—45 **18 Claims**



1. A centrifuge assembly comprising:

a rotor,

means defining a channel in said rotor, said channel having a portion of gradually increasing cross-sectional area formed solely by increasing its radial width, said channel having sidewalls of substantially uniform height and parallel to the axis of rotation of said rotor;

a disposable hollow container of semirigid material having two ends and received in said channel, said container in a dynamic mode conforming to said channel geometry, and

fluid connections coupled to said container.

4,447,222

TAMPON INSERTER

Sarnt Sartinoranont, Rte. 1, Box 758, Starke, Fla. 32091

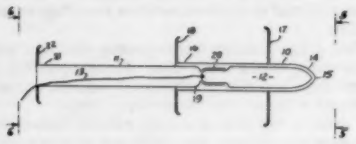
Filed Aug. 3, 1981, Ser. No. 289,398

Int. Cl.³ A61M *31/00*

U.S. Cl. 604—15 **12 Claims**

1. A device for inserting a sterile tampon into a human vagina comprising an elongated outer tube having forward and rearward opposite ends, an elongated hollow insertion tube telescopically slideable within said outer tube and having an

open back end, a sterile tampon engageable by said front end of said insertion tube, said outer tube having two spaced laterally outwardly projecting members, the first of said members being fixedly located generally spaced rearwardly from said forward end and being engageable with the labia so as to prevent insertion of said forward end into the vagina beyond the general location of the hymen remnant, and the second of said members being located adjacent said rearward end, said insertion



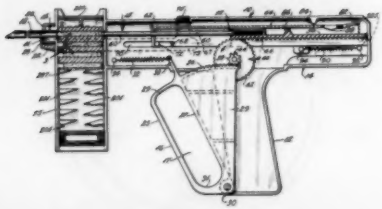
tube having a laterally outwardly projecting third member to prevent sliding of said insertion tube into said outer tube beyond the position where said tampon is disposed between the hymen remnant and the cervix when said first member engages the labia, said insertion tube with said third member engaging said second member having said front end projecting outwardly from said outer tube to forcibly eject said tampon from said outer tube into its position between the hymen remnant and the cervix.

4,447,223

MEDICAMENT IMPLANT APPLICATOR

Gordon E. Kaye, Garrison, N.Y.; Eugene B. Schwartz, Miami Beach, Fla., and Irving V. Sollins, Jiutepec Morelos, Mexico, assignors to CCT Associates, Bethesda, Md.

Filed Apr. 16, 1982, Ser. No. 369,200
Int. Cl.³ A61M *5/18*
U.S. Cl. 604—61 **6 Claims**



1. A pistol-like implanter device for implanting pellets into domestic animals which comprises:

a hollow needle adapted for insertion into a domestic animal mounted at the forward end of said implanter;

a passthrough chamber containing at least one pellet therein positioned to the rear of said needle in line with the bore thereof whereby such a pellet may be expelled from said chamber through the bore of said needle for implantation in a domestic animal;

a trigger means and a plunger means operatively connected whereby when said trigger means is pulled said plunger advances through said chamber into the bore of said needle expelling thereby said pellet, and thereafter retracts when said trigger means is released;

cam means connected to said plunger means to advance when said plunger means advances, to retract only after said plunger means has retracted sufficiently to clear said chamber; and

cam track means associated with said chamber wherein said cam rides, said cam and cam track being means to shift said chamber out of line with said needle upon retraction movement to place in line a successor chamber;

a passthrough cam track slot in the side wall of said cassette alongside each chamber;

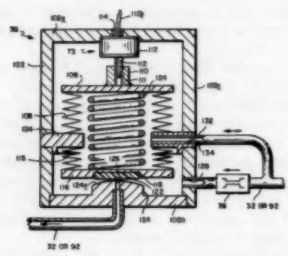
a diagonal cam track slot connecting adjacent passthrough cam track slots, whereby said cam traverses a passthrough slot during advancing movement, then on retraction movement is directed through the diagonal cam track slot to the next adjacent passthrough cam track slot, serving thereby to shift the cassette chamber by chamber whereby each chamber of the row may be emptied by successive pulls of said trigger.

4,447,224

VARIABLE FLOW IMPLANTABLE INFUSION APPARATUS

Leonard J. DeCant, Jr., Allston; Samir F. Idriss, Arlington, and Frank R. Prosl, Duxbury, all of Mass., assignors to Infusaid Corporation, Norwood, Mass.

Filed Sep. 20, 1982, Ser. No. 419,733
Int. Cl.³ A61M *5/14*
U.S. Cl. 604—67 **20 Claims**



1. Variable flow implantable infusion apparatus comprising

A. a housing;

B. a variable volume infusate chamber in the housing;

C. means for conducting infusate from said chamber to an infusion site outside the housing, said conducting means including series-connected fixed and electromechanically variable fluid flow restricting means;

D. means in the housing for maintaining the contents in the infusate chamber under a substantially constant pressure;

E. means for sensing the pressure differential across said fixed restricting means and producing indications in response thereto;

F. programmable processing means in the housing which

(1) sets the restriction of the variable flow restricting means at a selected programmed value,

(2) samples the indications from the sensing means at selected programmed intervals,

(3) compares each sample value with a reference value programmed into the processing means, and

(4) issues a command signal for controlling the variable restricting means so as to maintain this constant selected infusate flow rate; and

G. a battery for powering the variable restricting means and processing means.

4,447,225

MULTIDOSE JET INJECTOR

Barry E. Taff, 8665 Pickford St., Los Angeles, Calif. 90035, and Kenneth P. Stoller, 341 S. Bentley Ave., Los Angeles, Calif. 90049

Filed Mar. 22, 1982, Ser. No. 360,333
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—71 **14 Claims**

1. A multiple dose hypodermic jet injector for accomplishing the needleless injection of liquid medicaments comprising:

(a) a cylindrical injector body assembly defining in its forward portion a medicament delivery chamber and termi-

nating at its forward end in a nose piece containing a medicament ejection orifice;

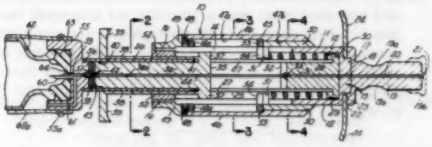
(b) an injection piston assembly slidably mounted within said body assembly and having a forward piston head portion and an elongated rearward tubular portion defining in its rearward section a medicament transfer chamber, said piston head portion having a central passageway therethrough;

(c) a medicament reservoir mounted at the rearward end of the tubular portion of said piston assembly and in medicament fluid communication with the transfer chamber of said piston assembly through a first one-way valve;

(d) spring means for advancing the piston assembly to eject medicament from said delivery chamber and through the medicament ejection orifice;

(e) a reciprocative medicament pump cylinder enclosed within the elongated rearward tubular portion of said piston assembly, said pump cylinder having a central passageway therethrough and a cannula mounted therein and extending forwardly therefrom within said piston assembly to and into the central passageway of the piston head portion of said assembly for slidable positioning therein and fluid communication therewith, the central passageway of said pump cylinder being in medicament fluid communication with the medicament transfer chamber of said piston assembly through a second one-way valve;

(f) fluid volume indicia means mounted on said cylindrical body assembly and adjustably positionable thereon, said indicia means including spring seating means which regulate the position of the piston head portion of the injection piston assembly when said assembly is in cocked position



with the spring means fully compressed and thereby establishes the volume of the medicament delivery chamber;

(g) pump cylinder limiting means mounted on said cylindrical body assembly and adjustably positionable thereon, said pump limiting means including pump stop means which regulate the extent of reciprocative movement of said pump cylinder and thereby establishes the volume of the medicament transfer chamber;

(h) medicament volume regulating means mounted on said cylindrical body assembly in cooperative engagement with said indicia means and said pump limiting means to simultaneously adjust the positions of said indicia means and pump limiting means and thereby adjust and establish the variable like volumes for the medicament delivery chamber and the medicament transfer chamber;

(i) piston puller means connected to the forward end of the reciprocative medicament pump cylinder and extending without the cylindrical injector body assembly for pulling said pump cylinder and the injection piston assembly rearwardly together against the pressure of the spring means to the cocked position established by the fluid volume indicia means and for thereafter reciprocating said pump cylinder first forwardly within the rearward section of said piston assembly to the pump stop means to aspirate liquid medicament from the medicament reservoir through the first one-way valve and into the medicament transfer chamber and thereafter rearwardly within said section of said assembly to pump the medicament from said transfer chamber through the second one-way valve, pump cylinder passageway and cannula, piston head passageway and into the medicament delivery chamber; and

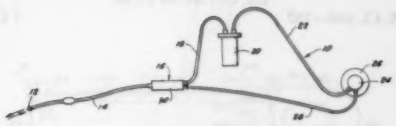
(j) a piston latch mechanism for maintaining the injection piston assembly in cocked position against the pressure of the spring means after said assembly has been pulled to such position by the puller means and during the reciprocating movements of said puller to transfer medicament from its reservoir to the delivery chamber and thereafter for releasing said piston assembly whereby said spring means expands to impart force to the piston head portion of said piston assembly with the resulting ejection of the medicament from said delivery chamber and through the medicament ejection orifice of said jet injector.

4,447,226

SURGICAL ASPIRATOR VALVE APPARATUS

Armando G. Mayoral, Av. Ruiz No. 558, Ensenada, Mexico

Filed Mar. 8, 1982, Ser. No. 355,457
Claims priority, application Mexico, Oct. 18, 1981, 189850
Int. Cl.³ A61M 1/00
U.S. Cl. 604—73 **7 Claims**



5. A non-cyclical aspirator system for use in surgery adapted to automatically remove large particles of matter and prevent clogging of said system, comprising:

a nozzle for engaging blood clots and other matter;

a first air suction line connected to said nozzle and extending to a waste receptacle;

a suction pump with means to activate the same;

a second air suction line extending from said receptacle to said pump;

a return air discharge line extending from said pump;

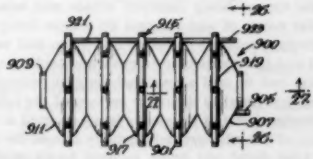
a single automatic non-cyclical valve means interposed in said first suction line and connected to said air line normally biased in an open suction position whereby said blood clots and other matter may be sucked through said nozzle, said first suction line and said valve to said receptacle, yet yieldable upon pressure change to move to an air intake position wherein said air flow is reversed and air will pass from said return air line through said valve, said first suction line and out said nozzle to discharge said large particles of matter.

4,447,227

MULTI-PURPOSE MEDICAL DEVICES

Constantine A. Kotsanis, River Grove, Ill., assignor to Endoscopy Surgical Systems, Inc., White Haven, Pa.

Filed Jun. 9, 1982, Ser. No. 386,558
Int. Cl.³ A61M 25/02
U.S. Cl. 604—95 **9 Claims**



1. A medical device, comprising:

fluid expansive, convoluted annular envelope means for positioning in a lumen of a tubular organ;

fluid flow passageway means communicating with said fluid expansive, convoluted annular envelope means with a fluid;

tube means extending at least partially through said fluid expansive, convoluted annular envelope means; and

suction stabilizing means operatively associated with and extending outwardly from said fluid expansive, convoluted annular envelope means for engaging the wall defining said lumen and retaining said envelope means under suction pressure at a desired anatomical site.

4,447,228

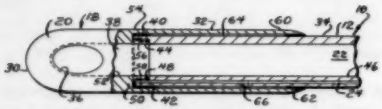
CATHETER

Bhupendra C. Patel, Elgin, Ill., assignor to The Kendall Company, Walpole, Mass.

Division of Ser. No. 146,421, May 5, 1980, Pat. No. 4,361,152, which is a continuation of Ser. No. 930,386, Aug. 2, 1978, abandoned, which is a continuation of Ser. No. 767,425, Feb. 10, 1977, abandoned, which is a continuation of Ser. No. 581,251, May 27, 1975, abandoned. This application Aug. 25, 1982, Ser. No. 411,254

Int. Cl.³ A61M *25/00*

U.S. Cl. 604—103 **1 Claim**



1. A retention catheter comprising:

an elongated shaft comprising an extruded tube having an outer surface, a distal end, a drainage lumen extending to the distal end of the tube, an inflation lumen extending through the wall of the tube to the distal end of the tube, an opening extending through the wall of the tube communicating between the inflation lumen and the outer surface of the tube, said opening being spaced from the distal end of the tube, and an annular tongue adjacent the outer surface of the tube and at the distal end of the tube, said tongue defining an inwardly-facing annular recess adjacent the drainage lumen at the distal end of the tube;

a tip secured to the tube adjacent its distal end, said tip having an outer surface, a drainage eye communicating with the drainage lumen of said tube, an axially-extending annular recess at the proximal end of said tip, and an axially-extending annular tongue adjacent the inner surface of said tip and at the proximal end of the tip, said tongue of said tip defining the inner surface of said axially-facing annular recess; and

an expansible annular sleeve of one-piece construction with said tip, said sleeve extending from the proximal end of the tip at its outer surface to proximal the opening between the inflation lumen and the outer surface of the tube, the distal end of said sleeve circumferentially surrounding the said tongue of said tip and defining the outer surface of said axially-facing annular recess,

said tube tongue being received within said axially-facing annular recess of said tip, said tip tongue being received within said annular recess of said tube, and said sleeve distal end being arranged to enshroud said tube tongue,

the distal end of said sleeve including an interior surface which is secured to the outer surface of the tube tongue, the proximal end of the sleeve being secured to the outer surface of the tube circumferentially around the shaft, and said tube distal end being secured to an axially-facing surface at the distal end of said tip recess and remote from said sleeve proximal end thus to provide a catheter tip structure less likely to be separated from said tube during use, and

said opening communicating between the inflation lumen and the outer surface of the tube being located intermediate said sleeve distal and proximal ends at a point remote from said tube distal end, whereby the patency of said opening will not be compromised during the assembly of said tip with said tube.

4,447,229

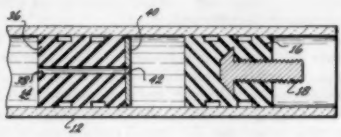
TAMPER-RESISTANT HYPODERMIC SYRINGE

Ida M. Butterfield, Santa Maria, Calif., assignor to Butterfield Group, Santa Maria, Calif.

Division of Ser. No. 364,011, Mar. 31, 1982, abandoned. This application Aug. 19, 1983, Ser. No. 524,473

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—111 **2 Claims**



1. A tamper-resistant hypodermic syringe comprising in combination:

a tubular member having a proximal end which is unobstructed and having a distal end;

a drive piston positioned within said tubular member;

a non-retractable stopper having a longitudinal passage to permit the syringe to be used for aspiration, said non-retractable stopper located within said tubular member immediately adjacent the distal side of said drive piston, but not connected to said drive piston;

a barrier impenetrable by a hypodermic needle and affixed to said non-retractable piston whereby the attempted insertion of a hypodermic needle through said non-retractable piston from the proximal end of said tubular member will cause said non-retractable stopper to be pushed toward the distal end, thereby giving a visual indication that the syringe has been tampered with.

4,447,230

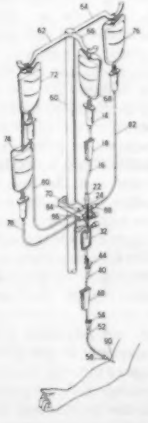
INTRAVENOUS ADMINISTRATION SET ASSEMBLY

John A. Gula, Richardson; John D. Brady, Dallas; Thomas C. Thompson, McKinney, and Joyce M. Alt, Houston, all of Tex., assignors to Quest Medical, Inc., Carrollton, Tex.

Filed Aug. 5, 1981, Ser. No. 290,257

Int. Cl.³ A61M *1/00*

U.S. Cl. 604—122 **12 Claims**



1. An intravenous administration set assembly capable of use

with at least three differing sources of intravenous fluid comprising:

adapter means (**58**) for mating with a corresponding adapter provided on a catheter (**90**) inserted into a patient;

air-eliminating filter means (**32**) having a hydrophilic membrane completely across the fluid flow path for receiving an air and fluid mixture through its inlet and separating the air therefrom so that only fluid may pass through its outlet;

tubing means (**38, 46, 56**) connecting the outlet of the air-eliminating filter means (**32**) to the adapter means (**58**);

fluid manifold means (**26**) having at least three inlets and a single outlet to allow for the sequencing of differing fluids from their respective sources, the outlet of the fluid manifold means (**26**) being connected to the inlet of the air-eliminating filter means (**32**) so that all fluid flowing from the outlet of the fluid manifold means must pass through the air-eliminating filter means regardless of the source of the fluid;

inlet adapter means (**28**) connected to each of the inlets of the fluid manifold means (**26**) so as to admit fluid thereto, each of the inlet adapter means (**28**) including a mating connector thereon so that it is securely mated in fluid-tight fashion to tubing connected from a respective one of the sources of intravenous fluid; and

one check valve means for each and every adapter means (**28**) connected so as to allow fluid to pass through the fluid manifold means (**26**) from the inlet adapter means (**28**) and so as to prevent the flow of fluid outward from the fluid manifold means (**26**) through the inlet adapter means (**28**) and so as to prevent the contamination of one of the sources of intravenous fluid connected to the manifold means (**26**) by another of those sources of intravenous fluid.

4,447,231

AUTOMATIC INJECTION SYRINGE

Hendrik M. Bekkering, Oist, Netherlands, assignor to Duphar International Research B.V., Weesp, Netherlands

Filed Jul. 22, 1982, Ser. No. 400,970

Claims priority, application Netherlands, Jul. 27, 1981, 8103531

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—131 **11 Claims**

1. An automatic syringe comprising a combination of a discharge mechanism, a cartridge holder and a cartridge slidably accommodated in the cartridge holder; said cartridge comprising an ampoule containing at least one injection liquid, a piston movable in the ampoule and a hypodermic needle connected to the front of the ampoule; said discharge mechanism including a power source that can move the cartridge from an inoperative to an operative condition, locking means for controlling the actuation of the power source and a safety device for blocking said locking device, said syringe being characterized in that a tablet holder is connected to the safety device in a manner such that the locking means are released simultaneously with removal of the tablet holder.

4,447,232

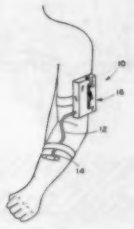
SPRING-OPERATED LIQUID-DISPENSING DEVICE

Andrew Sealfon, Middletown, and Carl Yurdin, Port Washington, both of N.Y., assignors to Repro-Med Systems, Inc., Middletown, N.Y.

Filed May 21, 1982, Ser. No. 380,564

Int. Cl.³ A61M *7/00*

U.S. Cl. 604—134 **2 Claims**



1. A spring-operated device for dispensing a liquid for achieving a medical or similar objective, said device comprising a rectangular-shaped housing bounding an internal compartment having a top cover disposed in covering relation over said compartment, said cover having a centrally located slot oriented longitudinally thereof opening into said compartment, a source of liquid in a collapsible bag disposed in said compartment, a slide member disposed in said compartment in pushing contact against said liquid-filled bag, a single constant torque spring of the type adapted to assume the form of helical coils disposed along one side of said compartment and operatively connected at one end to said slide member and at said opposite end to an end of said housing so as to urge said slide member through sliding movement through said compartment in response to said assumption of said helical coils at said end connected to said slide member, an upstanding leg on said slide member in projected relation into said slot of said cover so as to be adapted to track along said slot during said sliding movement of said slide member, whereby said tracking centrally along said cover by said slide member leg obviates any rotative tendency in said slide member as might be caused by said spring helical coils and correspondingly obviates any binding against said compartment walls by said slide member, a tracking member disposed for tracking movement in said slot of said cover attached to said projecting end of said upstanding leg of said slide member, and a clip means connected to said housing for selectively engaging said tracking member preparatory to commencing the liquid-dispensing service of said device.

4,447,233

MEDICATION INFUSION PUMP

William B. Mayfield, Costa Mesa, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Division of Ser. No. 252,779, Apr. 10, 1981, abandoned. This application Jul. 30, 1982, Ser. No. 403,679

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—152 **8 Claims**

1. A disposable insert for a liquid injection device having a first surface for engagement with the insert and a first surface for alignment of the insert, said disposable insert comprising:

a reservoir,

an outlet,

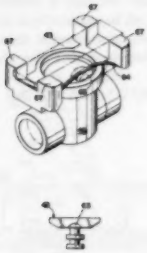
a pump disposed between said reservoir and said outlet, said pump including a housing that defines a variable volume pump chamber and a second engagement surface, said

pump further including a piston located in said pump chamber,

a first check valve disposed between said reservoir and said pump chamber,

a second check valve disposed between said pump chamber and said outlet,

movable means for altering the volume of said pump chamber, said movable means including an armature of electromagnetic material that is secured to and movable with said



piston, said armature being movable between the first engagement surface of the injection device and the second engagement surface of the disposable insert to control said piston, and

second alignment surface means disposed in a predetermined position relative to said second engagement surface and cooperating with said first alignment surface means to accurately position said second engagement surface with respect to said first engagement surface.

4,447,234

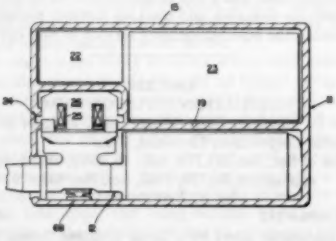
MEDICATION INFUSION PUMP

William B. Mayfield, Costa Mesa, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Division of Ser. No. 252,779, Apr. 10, 1981, abandoned, which is a continuation of Ser. No. 515,449, Jul. 20, 1983. This application Aug. 2, 1982, Ser. No. 403,999

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—151 **5 Claims**



1. A medication injection device comprising:

a reusable portion including;

a housing that has a solenoid compartment and a disposable portion compartment, said disposable portion compartment having a length no less than about twice its lateral width, and said solenoid compartment being adjacent one end of said disposable portion compartment,

a solenoid coil in said compartment, and

a solenoid core in said solenoid compartment; and

a disposable portion that is located in said disposable portion compartment, said disposable portion including;

an elongated reservoir having a length no less than about twice its lateral width, and

a pump at one end of said reservoir and located adjacent said solenoid compartment, said pump including a pump chamber connected to said reservoir by a passage;

an electromagnetic solenoid armature; and

means for releasably securing said disposable portion to said reusable portion, said releasable securing means including a spring that cooperates with the disposable compartment to bias the disposable portion against the reusable portion to control the stroke length of the armature.

4,447,235

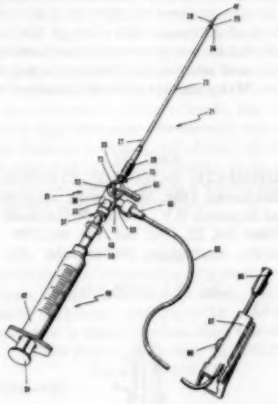
THORACENTESIS DEVICE

John M. Clarke, 861 Sixth Ave. South, St. Petersburg, Fla. 33701, assignor to John M. Clarke, St. Petersburg, Fla.

Filed May 7, 1981, Ser. No. 261,570

Int. Cl.³ A61B *1/26*

U.S. Cl. 604—169 **11 Claims**



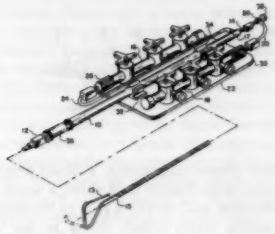
1. A thoracentesis device comprising an elongated flexible catheter having a distal end and a proximate end, means defining an elongated conduit including a value means and connected to the proximate end of said catheter and in line therewith, seal means at the distal end of said elongated conduit means continuously sealing said conduit means and the proximate end of said catheter from the atmosphere, a hollow needle having a sharpened distal end adapted to penetrate said seal means and to extend through said conduit means and said catheter and beyond the distal end thereof, means connected to the proximate end of said hollow needle for applying negative pressure to said needle, said needle being operable for complete withdrawl from said elongated conduit means and said seal means, said seal means being self-sealing and re-sealing said conduit means upon complete withdrawal of said needle from said conduit means and separation of said needle from said conduit means, said valve means being between said seal means and said catheter and said valve means movable to a first position where it connects said catheter to a side conduit means connected to and extending laterally of said elongated conduit means, and to a second position where it blocks communication between said elongated conduit means and said side conduit means.

4,447,236

INFUSION CATHETER SYSTEM

David R. Quinn, Pembroke Pines, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Feb. 5, 1982, Ser. No. 346,345
Int. Cl.³ A61M 5/00
U.S. Cl. 604—169 6 Claims



1. An infusion catheter system comprising: an elongate tubular housing member having a passageway extending therethrough; a first, guiding catheter having proximal and distal ends and having a passage extending therethrough, the proximal end of said first catheter being coupled to said housing member such that the passage of said first catheter communicates with the passageway in said housing member and the distal end being adapted to be inserted into an artery or vein; a second, infusion catheter having a passage extending therethrough and being movably positioned within the passage of said first catheter and having proximal and distal ends which extend beyond the proximal and distal ends respectively of the first catheter; first fluid delivery means including first valve means coupled to said housing member for supplying a first fluid through the passage of said first, guiding catheter; and, second fluid delivery means including second valve means coupled to the proximal end of said second catheter for supplying a second fluid through the passage of said second catheter for infusion through an opening in the distal end of said second infusion catheter into an artery or vein.

4,447,237

VALVING SLIT CONSTRUCTION AND COOPERATING ASSEMBLY FOR PENETRATING THE SAME

Eldon E. Frisch, Midland, Mich., and Leon C. Parks, Brandon, Miss., assignors to Dow Corning Corporation, Midland, Mich. and Research Against Cancer, Inc., Jackson, Miss., a part interest

Filed May 7, 1982, Ser. No. 376,002
Int. Cl.³ A61M 25/02, 1/03
U.S. Cl. 604—175 24 Claims

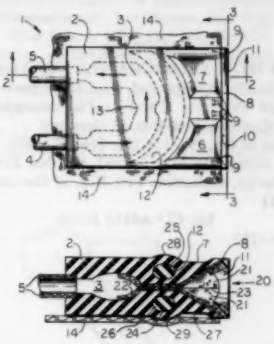
13. Apparatus for medical use in a pressurized fluid system associated with a living body comprising

insertable fluid engaging means for exterior insertion into communication with the pressurized fluid and

a valve assembly biased into a closed condition for sealingly containing the pressurized fluid in communication therewith and movable into a seal maintaining open condition in response to the insertion of said insertable fluid engaging means therethrough,

said valve assembly including a body of elastomeric material having flattened sleeve means therein; defining a slit presenting opposed surfaces interengaged when said valve assembly is in said closed condition and spaced apart when said valve assembly is in said open condition, said insertable fluid engaging means having a tapered end construction suitable for gradually moving said opposed surfaces from said closed interengaged condition into said open spaced apart condition in response to the insertion of said insertable fluid engaging means therethrough, said insertable fluid engaging means including an exterior periphery configured to be biasingly engaged in sealing relation by said opposed surfaces when the latter are in said open spaced apart condition,

said valve assembly further including means operable in addition to the bias provided by the elastomeric material of said body for yieldably biasing said opposed surfaces into sealed relation when in said closed interengaged condition and into sealed relation to the exterior periphery of said insertable fluid engaging means when in said open



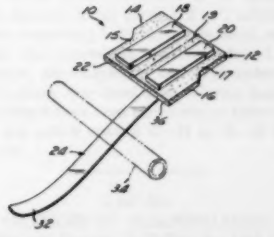
spaced apart condition, said additional biasing means including cavity means having a yieldable material under pressure therein so located with respect to said flattened sleeve means as to transmit the pressure thereof as the additional bias of the opposed surfaces into sealed relation when in said closed interengaged condition and into sealed relation with the exterior periphery of said insertable fluid engaging means when in said open spaced apart condition.

4,447,238

MEDICAL TUBING HOLDER

John D. Eldridge, Jr., Balboa Island, Calif., assignor to Instranetics, Inc., Tustin, Calif.

Continuation-in-part of Ser. No. 147,632, May 7, 1980, Pat. No. 4,336,806. This application Jan. 19, 1981, Ser. No. 226,493
Int. Cl.³ A61M 25/00
U.S. Cl. 604—280 15 Claims



1. A medical tube holder comprising:

(a) a backing element movable between folded and unfolded positions having first and second members with a mutual magnetic attraction spaced for mutual engagement when the element is folded; and

(b) an elongate strip having a free end and an end attached to said element, said strip being long enough to wrap around a tube to form a loop within which said tube is held and to permit said free end to be held between said engaged members locking said tube within said loop, said strip

being parallel to and offset from the longitudinal axis of one of said members.

4,447,239

CATHETER WITH RADIOGRAPHIC CONTRAST STRIPS

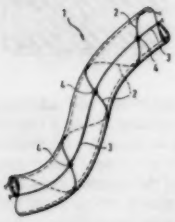
Victor Krütten, St. Wendel, Fed. Rep. of Germany, assignor to Dr. Eduard Fresenius Chemisch-Pharmazeutishe Industry KG, Bad Homborg, Fed. Rep. of Germany

Continuation of Ser. No. 125,154, Feb. 27, 1980, abandoned. This application May 5, 1982, Ser. No. 375,190

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1979, 2910741

Int. Cl.[3] A61M *25/00*

U.S. Cl. 604—282 12 Claims



1. A catheter having first and second radiographic contrast strips in or on the surface of the catheter and having no additional contrast strips, the first said contrast strip being arranged in a helix along the length of the catheter with the helix of the first contrast strip defining a substantially constant pitch when the catheter is in use such that the first contrast strip intersects the second contrast strip at predetermined and equally spaced distances along the catheter, whereby when the catheter is inserted into a patient, the equally spaced intersections of the first and second contrast strips enable an accurate determination of the length of insertion of the catheter.

4,447,240

DISPOSABLE DIAPER

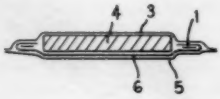
Osamu Ito, Utsunomiya, and Kazunori Nishizawa, Funabashi, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1981, Ser. No. 302,271

Claims priority, application Japan, Sep. 22, 1980, 55-132064

Int. Cl.[3] A41B *13/02*

U.S. Cl. 604—385 10 Claims



1. A disposable diaper comprising: a liquid-permeable surface sheet; a liquid-impermeable back sheet; a water-absorbing layer located between said sheets; a pair of bundles of water-absorbing shrinkable fibers which shrink in the lengthwise direction of the fibers and are rendered elastic on absorption of water, said bundles of water-absorbing shrinkable fibers being fixed along the edges in the central portion of said diaper and extending in the lengthwise direction of said disposable diaper and located so that said bundles of water-absorbing shrinkable fibers are not placed on the water-absorbing layer but are capable of being wetted when said diaper is wetted; and cellulose fibers extending between and connecting said water-absorbing layer and said bundles of water-absorbing shrinkable fibers for smoothly transferring liquid from said water-absorbing layer to said bundles of water-absorbing shrinkable fibers, wherein said cellulose fibers comprise an absorbent paper extending from said water-absorbing layer to said bundles of water-absorbing shrinkable fibers for transferring liquid from said water-absorbing layer to said shrinkable fibers, a central portion of said absorbent paper being interposed between said water-absorbing layer and said liquid-impermeable back sheet, said paper having lateral edge portions which extend beyond the edges of said water-absorbing layer such that said lateral edge portions of said absorbent paper are interposed between said bundles of water-absorbing shrinkable fibers and said liquid-impermeable back sheet, and the lateral ends of said lateral edge portions comprise flap portions of each of said lateral edge portions, which flap portions are folded over said bundles of water-absorbing shrinkable fibers and thereby interposed between said bundles of water-absorbing shrinkable fibers and said liquid-permeable surface sheet.

4,447,241

OXIDATIVE AFTERWASH TREATMENT FOR CREASE RESISTING FABRICS

James E. Hendrix, and George L. Payet, both of Fort Mill, S.C., assignors to Springs Industries, Inc., Fort Mill, S.C.

Filed Apr. 12, 1982, Ser. No. 367,398
Int. Cl.³ D06M 13/12, 13/34, 9/00
U.S. Cl. 8—116.4 10 Claims

1. A durable press treatment process for textile fabrics containing cellulosic fibers, said process being characterized by producing a durable press fabric having significantly reduced levels of released formaldehyde, and said process comprising applying to the fabric a formalin durable press finishing agent, directing the fabric through a curing oven and heating the fabric to effect crosslinking and impart durable press properties to the fabric while leaving in the fabric formaldehyde which can be liberated under conditions of storage and use, and impregnating the cured durable press treated fabric with an aqueous solution containing an oxidizing agent selected from the group consisting of sodium perborate, hydrogen peroxide, and sodium hypochlorite and maintaining the fabric in contact with the oxidizing agent for a time and at a temperature sufficient to oxidize and destroy releasable formaldehyde present in the fabric without destroying the durable press properties imparted to the fabric.

4,447,242

TEXTILE FINISHING

Ladislav Benisek, Burley-in-Wharfedale, England, assignor to Wool Development International Limited, London, England

Continuation-in-part of Ser. No. 243,601, Jan. 6, 1981, abandoned. This application Nov. 22, 1982, Ser. No. 443,288
Claims priority, application United Kingdom, Mar. 14, 1980, 8008756
Int. Cl.³ D06M 3/02, 13/20, 9/00
U.S. Cl. 8—128 R 11 Claims

1. A method of finishing keratinous textile articles which comprises treating the articles with an anionic titanium or zirconium complex at low pH, and with a bromo or chloro containing organic acid in aqueous solution at elevated temperature.

4,447,243

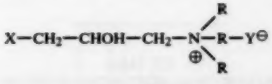
ODOR SCAVENGING SYSTEM

J. Lyle Claiborne, Hixson, Tenn., assignor to Dixie Yarns, Inc., Chattanooga, Tenn.

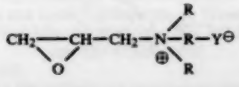
Continuation of Ser. No. 293,095, Aug. 17, 1981, abandoned. This application Aug. 29, 1983, Ser. No. 527,225
Int. Cl.³ D06M 13/34
U.S. Cl. 8—188 11 Claims

1. A method of freshening air, comprising:

wetting an odor preventing member and placing it in a position so that odor containing air may come into contact with the surface of the odor preventing member, said member comprising a substrate material reacted with an odor preventing material, said material comprising a compound from the group consisting of:



or a salt of epoxy propyl ammonium having the general formula



wherein X is a halogen radical, Y is chloride, bromide, sulfate or sulfonate, and the R's are methyl, ethyl, butyl or benzyl groups and hydroxyl substituted derivatives thereof.

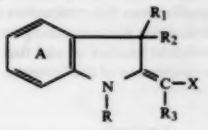
4,447,244

PROCESS FOR MASS-DYEING OF THERMOPLASTICS: POLYSTYRENE AND STYRENE COPOLYMERS WITH INDOLINE METHINE DYES

Bernhard Wehling, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 4, 1983, Ser. No. 464,073
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1982, 3206091
Int. Cl.³ C08J 3/20; C08K 5/34
U.S. Cl. 8—514 8 Claims

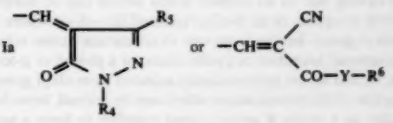
1. Process for mass-dyeing of polystyrene and styrene copolymers, characterised in that the dyestuffs used are of the formula



(I)

in which

X designates a radical



Ia or Ib

R designates hydrogen or alkyl,

R_1 and R_2 designate alkyl,

R_3 designates hydrogen, cyano, aroyl, alkoxycarbonyl, alkylcarbonyl or carbamoyl,

R_4 designates aryl,

R_5 designates alkyl, alkylcarbonyl, alkoxycarbonyl or aryl,

R_6 designates alkyl, aryl, aralkyl or aralkenyl, and

Y designates O or NR_7, with R_7 having the meaning hydrogen, alkyl, aralkyl or aryl, it being possible for the radicals which have been mentioned for R_7 and R_1–R_7 and which contain C—H or N—H bonds to be substituted, and wherein the ring A can carry 1, 2 or 3 substituents from the series comprising halogen, cyano, alkyl, alkoxy, alkylcarbonyl, alkoxycarbonyl, aralkoxycarbonyl, carbamoyl, sulphamoyl, alkylsulphonyl and arylsulphonyl, or can have a benzene ring fused to it, it being possible for the radicals which have been mentioned as substituents of the ring A and which contain C—H or N—H bonds to be substituted.

4,447,245

METHODS OF CLEANING COAL

Clay D. Smith, and Douglas V. Keller, Jr., both of Lafayette, N.Y., assignors to Otisca Industries, Ltd., Syracuse, N.Y.

Division of Ser. No. 3,641, Jan. 15, 1979, Pat. No. 4,244,699, which is a division of Ser. No. 561,168, Mar. 24, 1975, Pat. No. 4,173,530, which is a continuation-in-part of Ser. No. 423,577, Jan. 14, 1974, abandoned. This application Dec. 22, 1980, Ser. No. 218,636
Int. Cl.³ C10L 9/02
U.S. Cl. 44—1 SR 9 Claims

1. A process for preparing sulfur-containing coal for combustion having low SO_2 emissions, which comprises in combination:

(a) reducing the particle size of said coal;
(b) deeply cleaning said coal of reduced particle size by a heavy media method, the heavy media being a fluorochloro derivative of methane or ethane or 1,2-difluoroethane;
(c) admixing said clean coal with a finely divided inorganic material selected from the group consisting of an oxide or hydroxide of calcium or dolomite;
(d) forming said resulting admixture into large particles.

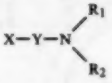
4,447,246

DIESEL FUEL

Clifford E. Smith; Harold W. Mark; Rector P. Louthan, and Howard F. Efner, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 16, 1983, Ser. No. 494,831
Int. Cl.³ C10L *1/08, 1/22, 1/24*
U.S. Cl. 144—57 **12 Claims**

1. A method of operating a compression-ignition engine which comprises injecting into the combustion chamber of the engine a liquid hydrocarbon fuel containing an amount effective to improve the cetane number of said fuel of at least one ignition accelerator compound of the formula:



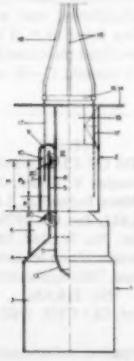
wherein X is an alkyl or alkylene (having one olefinic bond) group having one to six carbon atoms which can be normal, branched or cyclic; or an S-alkyl sulfenyl (R'—S—) where R' is an alkyl group having from one to six carbon atoms which can be normal, branched or cyclic chain; or a phenyl or p-tolyl group, R_1 and R_2 are independently selected from alkyl groups having one to six carbon atoms which can be normal, branched or cyclic; or a single R group joined together to form a saturated C_5N ring; or R_1 can be nitroso and R_2 can be an alkyl having from 1 to 3 carbon atoms, Y is an SO_2 or a SC:S group.

4,447,247

METHOD AND APPARATUS FOR COLLECTING OIL AND GAS FROM AN UNDERWATER BLOW-OUT

Naess, Erik B., Nils Lauritssons v. 46, Oslo, Norway

PCT No. PCT/NO80/00044, 371 Date Jul. 31, 1981, 102(e) Date Jul. 31, 1981, PCT Pub. No. WO81/01864, PCT Pub. Date Jul. 9, 1981
PCT Filed Dec. 18, 1980, Ser. No. 290,810
Claims priority, application Norway, Dec. 21, 1979, 794260
Int. Cl.³ E02B *23/00*
U.S. Cl. 55—55 **17 Claims**



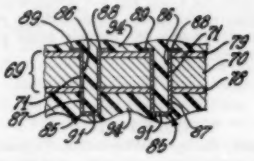
1. A method for collecting oil and gas flowing uncontrolled into a body of water beneath the water surface, especially in a blow-out from a point at the sea bed, wherein discharging oil and gas from the blow-out location is caught and ascends towards the surface within a tubular shell body, comprising the steps of: collecting the ascending gas in a floating gas bell provided at the upper end portion of the shell body, forming a gas or liquid trap against the surrounding water in that said bell has an outer wall projecting downwards and surrounding an upper portion of the shell body; and placing the gas automatically under a controllable positive pressure.

4,447,248

METHOD OF MAKING AND USING GLASS FIBER FORMING FEEDERS

Mohinder S. Bhatti, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jul. 15, 1982, Ser. No. 398,536
Int. Cl.³ C03D *37/095*
U.S. Cl. 65—2 **19 Claims**



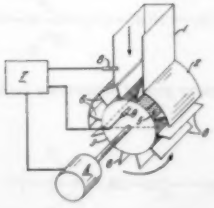
1. In a method of making glass filaments wherein a plurality of streams of molten glass issuing from an orificed discharge wall of a feeder are attenuated into said filaments, the improvement comprising said discharge wall being fabricated by:
inserting elements in apertures in a member;
hermetically sealing said elements and member within a coating adapted to isostatically transmit pressure to said elements and member;
applying isostatic pressure to the hermetically sealed elements and member to mechanially seal the elements to the member; and
heating the mechanically sealed elements and member to fuse the elements to the member to prevent the unwanted passage of molten glass between said elements and said member, said elements having an orifice to permit the passage of molten glass therethrough to establish said streams.

4,447,249

BLOWING WOOL SEPARATOR METHOD AND APPARATUS

David M. Kopena, Grand Rapids, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 16, 1982, Ser. No. 408,397
Int. Cl.³ C03B *37/03, 37/07*
U.S. Cl. 65—4.4 **10 Claims**



1. A method of improving the recovery of glass blowing wool which comprises:

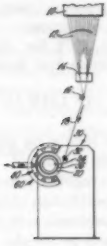
a. introducing the wool into contact with the foraminous surface of a revolving drum;
b. establishing a pressure differential across said surface of said drum by vacuum producing means;
c. altering the speed of revolution of said drum responsive to said pressure differential to build a layer of glass wool of substantially uniform thickness on the drum; and,
d. discharging said wool from said drum.

4,447,250

NOVELTY HEADBAND

John Wolens, 1000 North Lake Shore Dr., Chicago, Ill. 60611, and Leon Levy, 2112 N. Sedgwick, Chicago, Ill. 60614

Filed Apr. 4, 1983, Ser. No. 482,094
Int. Cl.³ A63H *29/16*
U.S. Cl. 46—1 F **2 Claims**



1. A novelty device including a resilient annular band having two free ends; a plurality of expandable members, each movable between a retracted position and an extended position in response to a differential in pressure within said members; a one-piece elongated mounting means secured to said band intermediate said free ends and supporting each of said expandable members, said mounting means being positioned generally adjacent and parallel to said annular band such that said expandable members are oriented generally perpendicular to said annular band; said mounting means including a manifold for transmitting fluid to and from each of the expandable members; conduit means for providing pressurized fluid to said manifold; and said manifold having one fluid input port in communication with said conduit means and a plurality of fluid discharge ports in communication with said expandable members, said input and discharge ports being joined by a common fluid passageway.

4,447,251

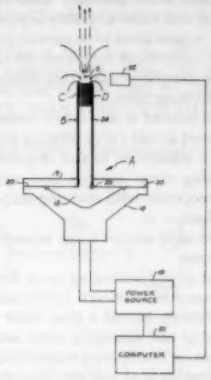
SONIC LEVITATION APPARATUS

Stanley A. Dunn; Alan R. Pomplun; Elmer G. Paquette, all of Madison, Wis.; Edwin C. Ethridge, and Jerry. L. Johnson, both of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 12, 1983, Ser. No. 493,866
Int. Cl.³ C03D *19/10*
U.S. Cl. 65—142 **20 Claims**

1. Apparatus for levitating a material specimen comprising: a duct having an interior adapted to be filled with gas;

a collimated passage means disposed within and at an end of said duct, said collimated passage means including an array of parallel passageways communicating with the interior of said duct with the surrounding atmosphere; and



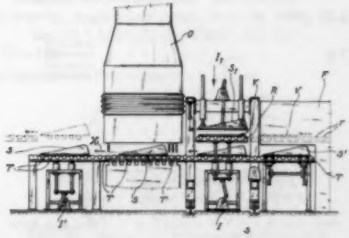
a sound generator means for imparting oscillatory motion to the gas within said duct so as to provide levitating force in the form of pulsed, unidirectional motion of gas axially beyond the end of said collimated passage means.

4,447,252

APPARATUS FOR CURVING AND TEMPERING OR HEAT TOUGHENING THIN GLASS SHEETS

Dino Di Nocco, Vasto, and Nicola Delle Donne, Casalbordino, both of Italy, assignors to Società Italiana Vetro - SIV - S.p.A., Italy

Filed Mar. 26, 1982, Ser. No. 362,131
Claims priority, application Italy, Apr. 6, 1981, 20938 A/81
Int. Cl.³ C03B *23/023*
U.S. Cl. 65—268 **4 Claims**



1. An apparatus for curving and tempering or heat toughening thin glass sheets, said apparatus including generally horizontally arranged starting, curve forming, quenching and unloading zones, said apparatus comprising:

a plurality of generally ring-shaped molds mounted for horizontal movement between said zones;

a vertically movable first roller assembly located at said curve forming zone;

means, located at said curve forming zone, for rapidly lowering said first roller assembly from an upper position, whereat said first roller assembly is positioned to receive and support a glass sheet to be curved, to a lower position, whereat the glass sheet supported by said first roller assembly is transferred to a said ring-shaped mold located at said curve forming zone;

an upper mold located at said curve forming zone;

means, positioned at said curve forming zone, for, when said glass sheet is transferred to said ring-shaped mold at said curve forming zone, moving said upper mold downwardly to cooperate with said ring-shaped mold to curve said glass sheet;

a vertically movable second roller assembly located at said unloading zone;

means, located at said unloading zone, for raising said second roller assembly between lower and upper positions thereof to thereby unload a glass sheet from a said ring-shaped mold at said unloading zone; and

carrousel means for transferring sequentially said plurality of ring-shaped molds in an endless horizontal path, such that said glass sheet supported by said ring-shaped mold at said curve forming zone is transferred sequentially from said curve forming zone to said quenching zone and then to said unloading zone, whereat said glass sheet is unloaded, and then the thus unloaded ring-shaped mold is transferred from said unloading zone to said starting zone and then back to said curve forming zone to receive a new glass sheet to be curved.

4,447,253

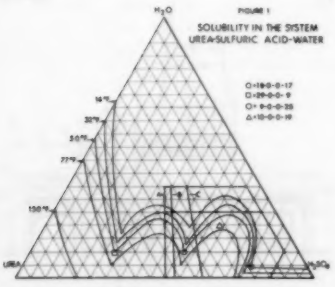
TOPICAL FERTILIZATION METHODS AND COMPOSITIONS FOR USE THEREIN

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Nov. 5, 1981, Ser. No. 318,368

Int. Cl.³ C05C *9/00*

U.S. Cl. 71—28 **24 Claims**



23. A method for topically fertilizing alkaline soils with urea, which method comprises applying to the surface of an alkaline soil having a pH of at least about 7.5 an aqueous solution of a reaction product of urea and sulfuric acid, wherein the sulfuric acid/urea molar ratio in said solution is at least about 0.7.

4,447,254

CONTROLLED RELEASE OF TRACE ELEMENTS

Alan C. Hughes, Liverpool; Richard C. Copeman, and Thomas N. R. Marples, both of Chester, all of England, assignors to McKenchnie Chemicals Limited, West Midlands, England

Filed Jul. 22, 1981, Ser. No. 285,699

Claims priority, application United Kingdom, Jul. 24, 1980, 8024324; Sep. 5, 1980, 8028801; Feb. 12, 1981, 8104390; Feb. 12, 1981, 8104391

Int. Cl.³ A01N *59/20, 59/00;* A61K *33/34*

U.S. Cl. 71—67 **21 Claims**

1. A method of employing in water a composition for releasing a controlled concentration of trace elements therein comprising a relatively water insoluble trace element compound and a plaster of paris binder mixed with said trace element and which mixture provides in water a composition having a different solubility product for the trace element compound.

4,447,255

PLANT GROWTH REGULATORS

Eberhard P. Schott, Neustadt, and Hans Lang, Limburgerhof, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 1, 1978, Ser. No. 965,263

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1977, 27559406

Int. Cl.³ A01N *57/12*

U.S. Cl. 71—86 **2 Claims**

1. A composition for regulating plant growth, consisting essentially of a synergistic mixture of

an effective amount to regulate plant growth of

(a) N,N-dimethylpiperidinium chloride and

(b) 2-chloroethylphosphonic acid, the ratio of (a):(b) being from 1:4 to 4:1 parts by weight.

4,447,256

N-(UNSUBSTITUTED OR SUBSTITUTED PYRIDYL)AMINOMETHYLENE-DIPHOSPHONIC ACIDS, HERBICIDAL COMPOSITIONS CONTAINING SAME, THEIR USE FOR HERBICIDES, AND PROCESS FOR PREPARING SAME

Fumio Suzuki, Funabashi; Yoshihiro Fujikawa, Tokyo; Susumu Yamamoto, Narashino; Hidemi Mizutani, Funabashi; Tunehiko Ohya, Ageo; Takashi Ikai, Tokyo, and Toshihiko Oguchi, Urawa, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

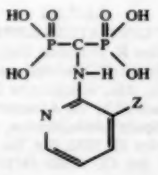
Continuation-in-part of Ser. No. 926,387, Jul. 20, 1978, abandoned. This application Jul. 29, 1980, Ser. No. 173,357

Claims priority, application Japan, Jul. 20, 1977, 52-86098; Jul. 27, 1977, 52-89910

Int. Cl.³ A01N *57/16;* C07D *213/72*

U.S. Cl. 71—86 **15 Claims**

6. A herbicidal composition comprising a herbicidally effective amount of a compound of the formula



wherein Z denotes hydrogen, an alkyl group having 1–3 carbon atoms or a halogen, or a salt thereof.

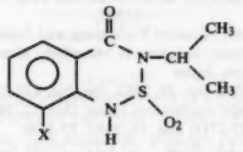
4,447,257

INHIBITING THE ANTAGONISM BETWEEN PYRIDYLOXY-PHENOXY ALKANOATE HERBICIDES AND BENZOTHIADIAZINONE HERBICIDES IN POST-EMERGENT APPLICATIONS

Ben C. Gerwick, III, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 16, 1981, Ser. No. 321,352
Int. Cl.³ A01N *25/00*
U.S. Cl. 71—91 20 Claims

1. A method of inhibiting the antagonism between pyridyloxy-phenoxy propionate herbicides and benzothiadiazinone herbicides of the formula



wherein

X represents hydrogen, chloro, bromo, fluoro, C_1–C_8 alkyl or nitro, and salts thereof, when applied post-emergently to unwanted vegetation in a composition containing both of said herbicides, said method comprising adding an amount of a non-phytotoxic petroleum distillate crop oil effective to inhibit the antagonism between the pyridyloxy-phenoxy propionate herbicide and the benzothiadiazinone herbicide.

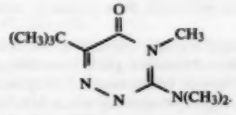
4,447,258

3-DIMETHYLAMINO-4-METHYL-1,2,4-TRIAZIN-5(4H)-ONES AND HERBICIDAL COMPOSITIONS

Karlfried Dickoré, Leverkusen; Klaus Sasse, Bergisch-Gladbach; Ludwig Eue, Leverkusen, and Robert R. Schmidt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 11, 1980, Ser. No. 120,174
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1979, 2908963; Mar. 7, 1979, 2908964; Sep. 22, 1979, 2938384
Int. Cl.³ C07D *253/06;* A01N *43/64*
U.S. Cl. 71—93 2 Claims

1. 3-Dimethylamino-4-methyl-1,2,4-triazin-5(4H)-one compound designated 6-tert.-butyl-3-dimethylamino-4-methyl-1,2,4-triazin-5(4H)-one of the formula



(Ia)

2. Method of combating setaria, sinapis, matricaria, galinsoga, stellaria, lolium, echinochloa, wheat, oats, cotton and maize which method comprises applying to such vegetation or its habitat a herbicidally effective amount of a 3-dimethylamino-4-methyl-1,2,4-triazin-5(4H)-one compound as claimed in claim 1.

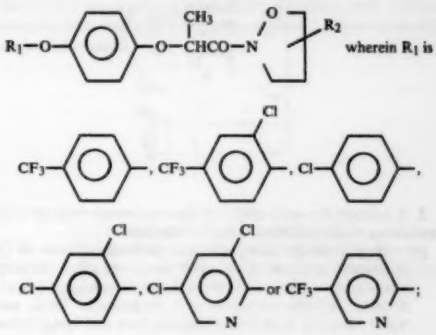
4,447,259

2-(SUBSTITUTED PHENOXY)PROPIONIC ACID DERIVATIVES AND THEIR USES FOR HERBICIDAL PURPOSES

Hiroshi Ohyama, Chigasaki; Sanse Takada, Atsugi; Ken Morita, Hiratsuka, and Saburo Yamamura, Fujisawa, all of Japan, assignors to Hokko Chemical Industry Co., Ltd., Nihonbashi, Japan

Filed Dec. 8, 1982, Ser. No. 447,892
Claims priority, application Japan, Dec. 18, 1981, 56-203416; Sep. 21, 1982, 57-163194; Sep. 24, 1982, 57-164967
Int. Cl.³ A01N *43/40;* C07D *413/02*
U.S. Cl. 71—94 14 Claims

1. 2-(Substituted-phenoxy)propionic acid derivative having the formula:



wherein R_1 is

and R_2 is a hydrogen atom or a lower alkyl group.

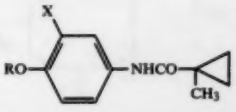
4,447,260

N-SUBSTITUTED PHENYL-1-METHYLCYCLOPROPANECARBOXAMIDES, AND THEIR HERBICIDAL USE

Hiroshi Noguchi, Toyonaka; Ryo Yoshida, Kawanishi; Seizo Sumida, Nishinomiya, and Katsuzo Kamoshita, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 6, 1981, Ser. No. 319,100
Claims priority, application Japan, Nov. 10, 1980, 55-158526
Int. Cl.³ A01N *53/00;* C07C *103/737*
U.S. Cl. 71—118 8 Claims

1. A compound of the formula:



wherein R is a methyl or ethyl group substituted with two or three fluorine atoms and X is a halogen atom or a trifluoromethyl group.

7. A method for exterminating weeds which comprises applying a herbicically effective amount of the compound according to claim 1 to the area where weeds are growing or will grow.

4,447,261

METHOD FOR SEPARATING NON-FERROUS METALS FROM IRON-CONTAINING MATERIALS

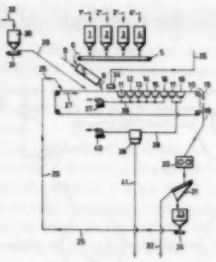
Hermann Hilbrans, Langenfeld, and Chatty Rao, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Nov. 10, 1981, Ser. No. 319,939

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1980, 3042941

Int. Cl.³ C01G *9/03, 21/00;* C22B *1/24, 1/16*

U.S. Cl. 75—5 9 Claims



1. A method for separating non-ferrous metals from an iron-containing waste material which comprises:

providing separate contiguous gas permeable layers of (1) said waste material in granular form and (2) a sintering mixture containing predominantly iron oxides and a finely divided carbonaceous fuel also in granular form, said waste material layer being thinner than and lying below said layer of sintering mixture, and

passing hot combustion supporting gases first through said layer of sintering mixture and then through said layer of waste material in a sintering zone under conditions sufficient to sinter the iron-containing constituents and volatilize the non-ferrous metals.

4,447,262

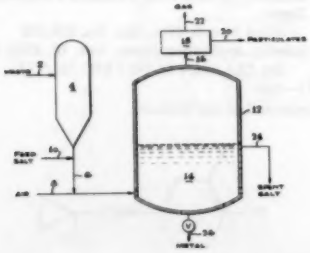
DESTRUCTION OF HALOGEN-CONTAINING MATERIALS

Richard L. Gay, Canoga Park; Arthur L. Kohl, and Samuel J. Yosim, both of Woodland Hills, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 16, 1983, Ser. No. 495,235

Int. Cl.³ C22B *7/00*

U.S. Cl. 75—65 R 13 Claims



10. A process for treating an organic waste containing halogen and nonreactive metal values which comprises:

providing a molten salt pool comprising a mixture of a basic alkaline earth metal compound selected from the group consisting of alkaline earth metal oxides and carbonates with an alkaline earth metal halide;

introducing into said pool a halogen-containing organic waste and an oxygen-containing gas in an amount sufficient to convert said waste into a gaseous combustion product and to cause the halogen present in said waste to react with said basic alkaline earth metal compound to form additional alkaline earth metal halide;

recovering said gaseous product, said alkaline earth metal halide and said nonreactive metal values from said molten salt pool; and

adding to said molten salt pool as salt makeup an alkaline earth metal oxide or carbonate.

4,447,263

BLADE MEMBER OF CERMET HAVING SURFACE REACTION LAYER AND PROCESS FOR PRODUCING SAME

Taijiro Sugizawa; Hironori Yoshimura, and Junichi Toyama, all of Tokyo, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 427,279

Claims priority, application Japan, Dec. 22, 1981, 56-207795; Jan. 7, 1982, 57-1211; Jan. 14, 1982, 57-3486

Int. Cl.³ B22F *7/02;* C22C *29/00, 32/00*

U.S. Cl. 75—233 7 Claims

1. A blade member for cutting tools which comprises a substrate of cermet containing, apart from impurities,

10 to 35% by volume of at least one metal selected from the group consisting of Fe, Co, Ni, Cr, Mo, W and Al,

5 to 40% by volume of at least one compound selected from the group consisting of carbides and nitrides of metals in groups IV_A, V_A and VI_A of the periodic table, and

balance titanium carbide and titanium nitride, in which the volume ratio of titanium nitride to titanium carbide plus titanium nitride is 0.2 to 0.6,

said substrate having on a surface thereof

a reaction layer composed of carbo-nitride of at least two metals in groups IV_A, V_A and VI_A of the periodic table, said at least two metals including Ti, said reaction layer having an average thickness of 0.5 to 15.0 μm, and the concentration of titanium in said reaction layer increases toward the surface thereof.

4,447,264

PRODUCTION OF MAGNETIC POWDER

Shintaro Suzuki; Sadao Iizuka, both of Shibukawa, and Yoshimi Moriya, Gunma, all of Japan, assignors to Kanto Denka Kogyo Co., Ltd., Tokyo, Japan

Division of Ser. No. 247,149, Mar. 24, 1981, Pat. No. 4,404,024, which is a division of Ser. No. 18,125, Mar. 7, 1979, Pat. No. 4,306,921. This application Mar. 21, 1983, Ser. No. 477,010

Claims priority, application Japan, Mar. 16, 1978, 53-30151

Int. Cl.³ B22F *1/00*

U.S. Cl. 75—251 7 Claims

1. Acicular magnetic powder consisting essentially of acicular iron particles having a high coercive force and a high saturation flux density, said particles being doped with at least one metal selected from the group consisting of Co, Mn, Ni, Ti, Bi, Mo, Ag, Cr, Zn, Si and Al and additionally containing an applied metal selected from the group consisting of cobalt, nickel, manganese and antimony and mixtures thereof, said iron particles having been produced in accordance with the process comprising

(a) treating finely divided starting material in the form of acicular particles selected from the group consisting of (i) a doped iron oxyhydroxide containing a doping component selected from the group consisting of Co, Mn, Ni, Ti, Bi, Mo, Ag, Cr, Zn, Si, Al and mixtures thereof and (ii) a doped iron oxide containing a doping component selected from the group consisting of Co, Mn, Ni, Ti, Bi, Mo, Ag, Cr, Zn, Si, Al and mixtures thereof with an aqueous solution or suspension of an applied metal compound selected from the group consisting of cobalt, nickel, manganese and antimony compounds and mixtures thereof or a mix-

ture of said solution and said suspension so that said applied metal compound is applied on said particles,

(b) filtering said treated particles from the liquid medium to form a cake comprising said treated particles and drying said cake and,

(c) reducing said dry cake in a reducing gas stream at a temperature up to 600° C. to reduce said treated particles of doped iron oxyhydroxide or doped iron oxide containing said applied metal compound whereby the individual particles are not sintered and the initial shape of the microparticles of the starting material is retained to form said acicular magnetic powder.

4,447,265

METHOD AND COMPOSITION FOR FOAMING SLAG IN ELECTRIC ARC FURNACE

John W. Schwer, 1349 Azalea Dr., Munster, Ind. 46321

Filed Jun. 27, 1983, Ser. No. 507,767

Int. Cl.³ C21C *7/00*; C22B *9/10*

U.S. Cl. 75—257 **10 Claims**

1. A slag-foamimg composition for use in electric arc furnace steelmaking comprising from about 15 to about 80 wt% of a carbon source, the remainder consisting substantially of a source of an oxide of calcium.

4,447,266

CEMENTITIOUS COMPOSITION

Solomon J. Nachfolger, Monsey, N.Y., assignor to Diamond Shamrock Chemicals Company, Dallas, Tex.

Filed Sep. 7, 1982, Ser. No. 415,741

Int. Cl.³ C04B *7/35*

U.S. Cl. 106—90 **10 Claims**

1. A hardened cementitious composition having improved compressive strength and reduced water content prepared from a cementitious composition and an effective amount of a free acid of a condensation product of naphthalenesulfonic acid and formaldehyde wherein anionic materials in the free acid have equivalent elution volume by size exclusion chromatography of from about 61% to about 70% of the total elution.

4,447,267

DRY SET GROUT

Joseph J. Chesney, Jr., Plainsboro, and Scott C. Broney, Trenton, both of N.J., assignors to Tile Council of America, Inc., Princeton, N.J.

Filed Oct. 14, 1981, Ser. No. 311,163

Int. Cl.³ C04B *7/353*

U.S. Cl. 106—93 **4 Claims**

1. In a dry-set grout composition adapted to be mixed with water to a workable consistency, containing Portland cement, filler, bentonite clay, a cellulose ether and polyacrylamide, the improvement comprising the use of less than about 60% but more than 50% Portland cement, from 25% to 50% of filler, about 0.15% bentonite clay, and not more than about 0.35% of a composite of a cellulose ether and polyacrylamide whrein the ratio of said cellulose ether to polyacrylamide is between 40 and 70 to 1, the resulting composition characterized by improved workability, stain resistance and cleaning properties over previously employed Portland cement based grouts.

4,447,268

IVORYLIKE COMPOSITION PLATE FOR COVERING A WOODEN BASE

Yutaka Oshima, 10-1, Nakazawa-cho, Hamamatsu-shi, Shizuoka-ken, Japan

Continuation of Ser. No. 296,483, Aug. 26, 1981, abandoned. This application Jun. 10, 1983, Ser. No. 501,968

Claims priority, application Japan, Sep. 2, 1980, 55-121663; Dec. 2, 1980, 55-172956

Int. Cl.³ C08L *89/00*

U.S. Cl. 106—148 **11 Claims**

1. An ivorylike composition plate for covering a wooden base comprising casein resin matrix hardened with formaldehyde and from about 14.3 to about 47.0% by weight of hydrated inorganic filler selected from the group consisting of alumina hydrate, basic magnesium carbonate, hydrated aluminum silicate, magnesium silicate, hydrated silicic acid, calcium sulfate hydrate and hydrated calcium silicate, dispersed in said casein resin matrix.

4,447,269

CATIONIC AQUEOUS BITUMINOUS EMULSION-AGGREGATE SLURRIES

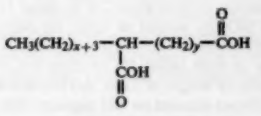
Hans G. Schreuders, and Peter Schilling, both of Charleston, S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Jul. 13, 1982, Ser. No. 397,911

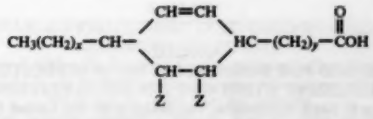
Int. Cl.³ C08L *95/00*

U.S. Cl. 106—277 **12 Claims**

1. A paving slurry seal mixture of a cationic aqueous bituminous emulsion and mineral aggregate capable of being worked comprising: a densely graded mineral aggregate passing through No. 4 and at least 80% retained on 200 mesh screen; from about 8% to about 20% of an oil in water type emulsion, based on the weight of the mineral aggregate, wherein the emulsion is comprised of from about 55% to about 65% bitumen, based on the weight of the emulsion, from about 0.5% to about 2% of a cation-active emulsifier based on the weight of the emulsion, wherein the emulsifier is selected from the group consisting of reaction products of one or more polyamines reacted with a polycarboxylic acid corresponding to the formulae



and



wherein x and y are integers from 3 to 9, x and y together equal 12, at least one Z is a carboxylic acid group and any remaining Z is hydrogen, and water to make up 100% by weight of the emulsion, the emulsion having a pH in the range of from 2-7; from about 4% to about 16% water, based on the weight of the mineral aggregate, added to form a slurry of the aggregate and the emulsion; and up to 3% of an inorganic or organic additive to reduce the setting time of the mixture.

4,447,270

PIGMENTS AND THEIR PREPARATION BY COATING WITH OXIDES OF ZR-SI-AL

Peter B. Howard, and Derek O'Donnell, both of Cleveland, England, assignors to Tioxide Group PLC, Cleveland, England

Filed Sep. 30, 1982, Ser. No. 428,868
Claims priority, application United Kingdom, Oct. 30, 1981, 8132844
Int. Cl.³ C09C 1/36
U.S. Cl. 106—300 12 Claims

1. Titanium dioxide pigments comprising particulate titanium dioxide having (i) an inner coating on a core of rutile titanium dioxide of an oxide or hydrous oxide of zirconium in an amount of from about 1% to about 4% by weight, expressed as ZrO_2 by weight of TiO_2; (ii) a coating of dense, amorphous silica in an amount of from about 2% to about 12% by weight, expressed as SiO_2 by weight of TiO_2 carried on the inner coating; and (iii) an outer coating of a hydrous oxide of alumina in an amount of from about 1% to about 6% by weight, expressed as Al_2O_3 by weight of TiO_2.

4,447,271

PIGMENTS AND THEIR PREPARATION BY COATING WITH OXIDES OF SI-ZR-AL

Peter B. Howard, and Derek O'Donnell, both of Cleveland, England, assignors to Tioxide Group PLC, Cleveland, England

Filed Sep. 30, 1982, Ser. No. 428,788
Claims priority, application United Kingdom, Oct. 30, 1981, 8132845
Int. Cl.³ C09C 1/36
U.S. Cl. 106—300 11 Claims

1. Titanium dioxide pigment which comprises pigmentary titanium dioxide having (i) an inner coating on a core of rutile titanium dioxide of dense, amorphous silica in an amount of from about 2% to about 12% by weight, expressed as SiO_2 by weight of TiO_2; (ii) carried on said inner coating, a second coating of a hydrous oxide of zirconium in an amount of from about 1% to about 4% by weight, expressed as ZrO_2 by weight of TiO_2; and (iii) an outer coating containing a hydrous oxide of aluminum in an amount of from about 1% to about 6% by weight, expressed as $Al_2O_3$by weight of TiO_2.

4. A process for the manufacture of titanium dioxide pigment which comprises (i) forming an aqueous dispersion of a particulate core material comprising rutile titanium dioxide in admixture with a water-soluble silicate and depositing at a pH greater than 8 a dense, amorphous inner coating of silica on the core material in amount of from about 2% to about 12% by weight, expressed as SiO_2 by weight of TiO_2; (ii) depositing on said inner coating a second coating of a hydrous oxide of zirconium in an amount of from about 1% to about 4% by weight, expressed as ZrO_2 by weight of TiO_2; and (iii) depositing an outer coating of hydrous alumina on said pigment after deposition of said hydrous oxide of zirconium in an amount of from about 1% to about 6% by weight, expressed as Al_2O_3 by weight of TiO_2.

4,447,272

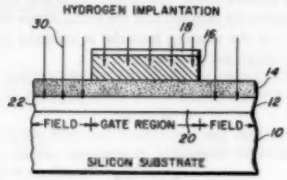
METHOD FOR FABRICATING MNOS STRUCTURES UTILIZING HYDROGEN ION IMPLANTATION

Nelson S. Saks, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 22, 1982, Ser. No. 443,828
Int. Cl.³ H01L 7/54, 21/263
U.S. Cl. 148—1.5 9 Claims

1. An improved method for reducing the density of electronic trapping states and fixed insulator charge in the oxide layer of an MNOS structure of the type having a gate, said oxide layer including a gate region disposed below the gate, and a field region surrounding said gate region, said method comprising the steps of:

implanting hydrogen ions in the MNOS structure such that the gate blocks the hydrogen implant from the gate region of the oxide layer, the field region of the oxide layer of the MNOS structure thereby being implanted with hydrogen ions; and



annealing the MNOS structure to cause said implanted hydrogen ions in the field region of the oxide layer to diffuse laterally into the gate region of the oxide layer and to chemically react at the Si—SiO_2 interface to reduce the density of electronic trapping states and fixed oxide charge.

4,447,273

PROCESS FOR PHOSPHATING METALLIC SURFACES IN NONAQUEOUS PHOSPHATING BATHS

Dieter J. Mueller; Hermann Fricke, and Heinrich Spielbrink, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Mar. 16, 1983, Ser. No. 475,798
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1982, 3209828
Int. Cl.³ C23F 7/10
U.S. Cl. 148—6.15 R 20 Claims

1. A process for phosphating a metallic surface of an article in a phosphating bath which comprises effective amounts of a low-boiling halogenated hydrocarbon, aqueous phosphoric acid, an alcohol and, optionally, a stabilizer, phosphating regulator or accelerator,

comprising at least twice dipping the surface to be phosphated, for at least 10 seconds each time, into said bath under boiling conditions, the surface being at essentially the same temperature as that of the vapor from the boiling bath, and, in the time interval between dippings, treating the surface for at least 20 seconds in the vapor of the boiling bath.

4,447,274

CONDUCTOR POWDERS

Neil Matheson, III, Garland, Tex., assignor to Graham Magnetics Incorporated, North Richland Hills, Tex.

Division of Ser. No. 17,419, Mar. 5, 1979, Pat. No. 4,347,165. This application Mar. 17, 1982, Ser. No. 358,846
Int. Cl.³ C23F 7/24
U.S. Cl. 148—6.24 9 Claims

1. A process for stabilizing the electroconductive properties of a mass of electroconductive metallic powder having a protective coating formed thereon of a silicide, nitride, carbide or boride of said electroconductive metal by treating the surface of said powder by

(a) dispersing said metal powder in a reaction medium;

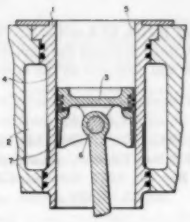
(b) adding a known amount of sulfur to such medium and reacting said dispersed metal powder with said

(c) said known amount of sulfur effective to improve the corrosion resistance of powder.

4,447,275
CYLINDER LINER

Takeshi Hiraoka; Shigeru Urano, both of Saitama, and Kiyoshi Yamamoto, Chiba, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1982, Ser. No. 342,282
Claims priority, application Japan, Jan. 28, 1981, 56-10257
Int. Cl.³ C21D *1/06*; F02F *1/10*; B23P *9/00*
U.S. Cl. 148—152 22 Claims



1. A cylinder liner for an internal combustion engine, comprising:

a white cast iron layer formed on a part of an outer peripheral surface of said cylinder liner which is exposed to cooling water;

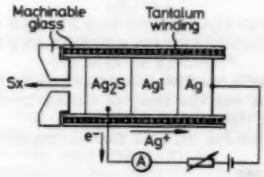
a thermally affected layer formed between said white cast iron layer and a parent material of said cylinder liner, said thermally affected layer having a thickness of at least 0.05 mm;

said white cast iron layer and said thermally affected layer being formed by remelting and cooling said part of said outer peripheral surface of said cylinder liner.

4,447,276
MOLECULAR BEAM EPITAXY ELECTROLYTIC DOPANT SOURCE

Graham J. Davies, Woodbridge; Roger Heckingbottom, and David A. Andrews, both of Ipswich, all of England, assignors to The Post Office, London, England

Filed Jun. 15, 1981, Ser. No. 274,286
Int. Cl.³ H01L *21/203*
U.S. Cl. 148—175 3 Claims



1. A method of growing solid semiconductor material composed of group III and V elements from the vapor phase by epitaxial deposition on a substrate using one or more molecular beams formed from material in an effusion cell, including the step of:

producing a beam of dopant material for said semiconductor material in an electrochemical cell within the effusion cell by applying a controlled emf to said electrochemical cell, wherein the dopant material is one of either sulphur, selenium or tellurium, and said electro-chemical cell comprises successively adjacent regions of Ag_2X, Ag I and Ag, where X is S, Se or Te respectively.

4,447,277
MULTIPHASE THERMOELECTRIC ALLOYS AND METHOD OF MAKING SAME

Tumkur S. Jayadev, Rochester, and On V. Nugyen, Sterling Heights, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 341,864, Jan. 22, 1982, abandoned. This application Aug. 27, 1982, Ser. No. 412,306
Int. Cl.³ C22C *28/00*
U.S. Cl. 148—400 119 Claims

30. A material for thermoelectric applications having low thermal conductivity and high electrical conductivity, said material comprising:

a multiplicity of matrix crystallites including at least bismuth, tellurium, and antimony, said crystallites being separated by disordered grain boundaries bordering said crystallites and grain boundary regions between said grain boundaries, said grain boundary regions including a plurality of phases including electrically conductive phases including at least one element having high electrical conductivity, and said grain boundaries including transitional phases varying in composition from the composition of said crystallites to the composition of said phases within said grain boundary regions.

32. A method of making a material for thermoelectric applications having low thermal conductivity and high electrical conductivity, said method comprising the steps of:

forming a mixture of at least first and second multiple element compounds, at least one of said compounds including at least one element having high electrical conductivity, heating said mixture to an elevated temperature, and thereafter cooling said mixture to form from said mixture of compounds a multiphase solid alloy material differing substantially in macroscopic structure, compositional distribution and thermal and electrical properties from a material formed from the constituent elements of said compounds alone, said multiphase alloy comprising a first phase of a multiplicity of matrix crystallites separated by macroscopic disordered grain boundary regions having at least electrically conductive phases with said at least one element having high electrical conductivity therein.

4,447,278
CASTABLE PYROTECHNIC COMPOSITION WITH A CHLORINATED BINDER

Georges A. Sédat, St.-Raphael, France, assignor to Etat Francais représenté par le Delegue General pour l'Armement, France

Filed Jul. 26, 1982, Ser. No. 402,076
Claims priority, application France, Aug. 10, 1981, 81 15468
Int. Cl.³ C06B *45/10*
U.S. Cl. 149—19.91 11 Claims

1. A castable pyrotechnic composition such as a smoke composition or flare composition comprising oxidizing and reducing pyrotechnic ingredients and a chlorinated binder, said binder comprising a polymerizable chlorinated monomer and a copolymerized or non-copolymerized chlorinated polymer.

4,447,279

AUTOMATIC ARTIFICIAL TREE

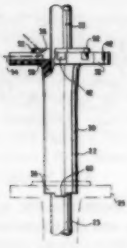
Pierre U. Boisvert, Granby, and Jean-Daniel Bapst, Ste-Cécile de Milton, both of Canada, assignors to Barcana Ltee, Granby, Canada

Division of Ser. No. 352,590, Feb. 26, 1982. This application Sep. 23, 1982, Ser. No. 422,032

Claims priority, application Canada, Jan. 18, 1982, 394375

Int. Cl.³ A47G *33/06*

U.S. Cl. 156—61 **2 Claims**



1. A method of assembly of an automatic artificial Christmas tree using a plurality of vertically nested branch holders, each branch holder comprising a branch holding ring and a tubular spacer, depending from said ring in fixed relationship thereto, each branch holding ring comprising a generally planar disc-body of rigid material, with a central hole for including a support means, a coaxial fulcrum ring on the upper surface of the disc-shaped body, a plurality of radially extending branch receiving slots on said upper surface below said fulcrum ring, the slots having laterally confining means, said method comprising the steps of:

inserting the inner straight end of the stem of a wire branch into one of the branch receiving slots of one of the branch holders, such that said inner straight end is secured against downward movement, lifting the free end of said branch upwardly about the fulcrum ring sufficiently to cause said fulcrum ring to bend the free end, relative to the inner end of the said branch, over an angle of the order of 90°, placing additional branches into the same branch holder, in different slots thereof, and performing said bending step thereon until the desired number of branches are inserted in their respective slots and bent, such that the free end of the branches are properly positioned relative to their respective slots, and thereafter placing one or more branch holders, loaded with branches, into vertical interconnected alignment with each other, and locking said branches in position on their branch holders until a stack of branch holders of sufficient height is reached such that the length of the branches in the successive rows and the relative angular position of each branch holder relative to the adjacent branch holders are appropriate to provide a pleasant structural conical shape.

4,447,280

LABELLING MACHINE

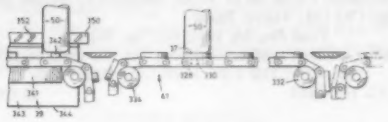
Martin D. Maltbouse, 204 Glen Rd., Toronto, Ontario, Canada

Filed Oct. 22, 1981, Ser. No. 313,850

Int. Cl.³ B29C *27/20*

U.S. Cl. 156—85 **9 Claims**

1. A labelling machine for applying heat shrinkable labels to a container, said machine comprising a label feeder, a label applicator to receive labels from said feeder and apply a leading edge of said label to said container, drive means to move said container past said applicator and draw the label onto the container to form a cylindrical sleeve, said drive means including a platen to support said container adjacent said applicator such that said label depends from said container and is supported by the periphery of said platen during application of said label, a heat chamber and transfer means to transfer said



container from said platen to a conveyor to move at least a portion of the container through the heat chamber and cause said label to shrink and conform to the container.

4,447,281

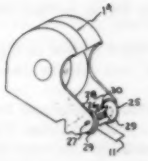
DISPENSER FOR APPLYING ADHESIVE TAPE

Richard L. Joy, 1011 San Eduardo, Henderson, Nev. 89015

Filed Sep. 30, 1982, Ser. No. 428,878

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—250 **7 Claims**



1. A dispenser for applying adhesive pressure sensitive tape to a surface, comprising:

a housing including:

means to hold a roll of pressure sensitive tape and allowing rotation of the roll as the tape is peeled from the roll;

a guide for directing the tape from the dispenser onto the surface, and

a cutting mechanism to be contacted by said tape as it is directed towards said surface, said cutting mechanism comprising a roller mounted for rotation about a shaft supported for rotation on said housing and having attached thereto at least one cutting member extending radially from said shaft and in a position to contact and sever said tape.

4,447,282

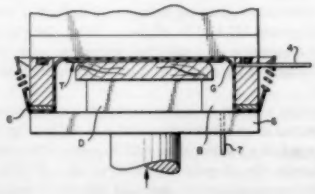
PROCESS AND EQUIPMENT FOR VENEER PRESS TO GLUE A THIN LAYER ON A VARIOUSLY SHAPED PANEL SURFACE

Savorgnan Valerio, via S.Margherita n.42, Tamai (Pordenone), Italy (33070), and Mio Dino, via Centro, 70, Summaga Di Portogruaro, Italy (30026)

Filed Jun. 21, 1982, Ser. No. 390,285

Int. Cl.³ B29C *17/00*

U.S. Cl. 156—285 **9 Claims**



1. A process for adhering thin layers onto variously shaped

or flat surfaces by means of adhesive therebetween and a press having a heated upper pressing plate and frame, an elastic diaphragm enclosing an open end of said frame, and a heated lower pressing plate, comprising the steps of:

(a) withdrawing medium from an interior cavity of said frame to retract said diaphragm into contact with said heated upper pressing plate and thereby heat said diaphragm;

(b) disposing a thin layer and a surface on said heated lower pressing plate,

(c) displacing said lower pressing plate into engagement with said diaphragm and frame whereby said thin layer and surface are pressed together by said upper and lower pressing plates,

(d) simultaneously introducing medium into said cavity and evacuating medium from an area between said lower pressing plate and diaphragm to draw said diaphragm over the periphery of said layer and surface to effect a pressing therebetween,

(e) reversing the process of step (d),

(f) separating said lower pressing plate from said diaphragm and frame, and removing the pressed together layer and surface from said lower pressing plate, and

(g) continuously repeating steps (b) through (f).

4,447,283

ADHESIVE FOR CERAMIC ARTICLES AND METHOD FOR ADHESION THEREOF

Yoshihiro Ebata, Kawanishi; Saburo Kose, Ikeda, and Ryozo Hayami, Takarazuka, all of Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Sep. 16, 1982, Ser. No. 418,753

Claims priority, application Japan, Mar. 4, 1982, 57-34558; Mar. 4, 1982, 57-34559

Int. Cl.³ C09J *1/00*

U.S. Cl. 156—325 **2 Claims**

1. A method for the adhesion of a ceramic article of silicon nitride to an article selected from the group consisting of ceramic articles of silicon nitride and mullite-type ceramic articles, said method comprising interposing between the two ceramic articles an adhesive comprising as active components 40% to 70% by weight of sodium fluoride and 60% to 30% by weight of yttria, and heating said adhesive to a temperature in the range of from about 1000° C. to about 1500° C., thereby adhering the two ceramic articles without forming any pinholes in the formed layer of adhesive.

4,447,284

SEAL ARM LATCHING MECHANISM FOR HEAT SEALING APPARATUS

Frank G. Shanklin, Groton, and James A. McConnell, Ayer, both of Mass., assignors to Shanklin Corporation, Ayer, Mass.

Filed Jan. 10, 1983, Ser. No. 456,964

Int. Cl.³ B30B *15/16, 15/34;* H05B *1/00*

U.S. Cl. 156—366 **10 Claims**

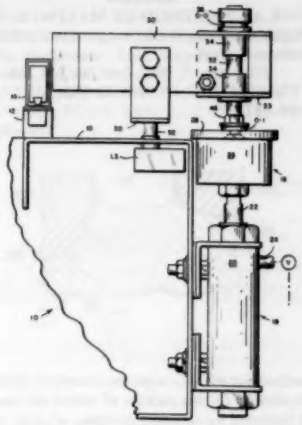
1. In a wrapping machine using thermoplastic film having a sealing bed on the machine frame and a heat-sealing jaw supported for movement from a remote position to a position of engagement with said sealing bed to seal said frame therebetween, the improvement comprising:

electromagnetic means having an electromagnet and an armature; means for mounting the armature on the heat-sealing arm;

a piston and cylinder assembly fixed to said frame with said piston rod in alignment with said armature when said jaw approaches the position of engagement with said sealing bed;

means for mounting said electromagnet to said piston rod in a position such that movement of the heat-sealing jaw toward engagement with said sealing bed brings said armature to a position to make magnetic contact with said electromagnet; and

switch means operated when the said heat-sealing jaw is moved toward said sealing bed to energize said electro-



magnet and when proximate to said sealing bed to supply pressure fluid to the cylinder in a direction to move the electromagnetic means in a direction to apply pressure to the heat-sealing jaw against said sealing bed.

4,447,285

DEVICE FOR HOLDING PAPER CLOSE AGAINST A CORRUGATING ROLLER IN A CORRUGATED BOARD-MAKING MACHINE

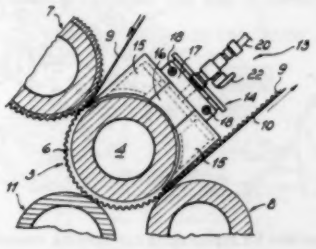
Riccardo Lussana, Casatenovo, and Fabrizio Massenzana, Arcore, both of Italy, assignors to Vitino Massenzana s.r.l., Arcore, Italy

Filed Sep. 30, 1983, Ser. No. 537,522

Claims priority, application Italy, Dec. 29, 1982, 25025 A/82

Int. Cl.³ B31F *1/28*

U.S. Cl. 156—473 **7 Claims**



1. A device for holding paper close against a corrugating roller in a corrugated board-making machine, comprising suction members correlated to a suction control apparatus and connected to said corrugating roller on the unoccupied side thereof by the paper to be held thereagainst, said suction members being communicated to said paper through circular indentations formed on the shroud of said corrugating roller, characterized in that said suction members comprise a plurality of suction ports so flattened as to fit, at least in part, in said indentations and being made rigid with holders carried slidably on parallel bars to said corrugating roller, and in that said holders are guided along said bars by locating elements made rigid with said holders and being inserted into said indentations in

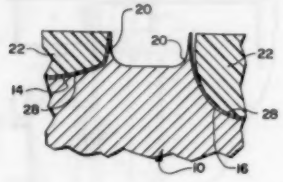
substantially direct contact relationship with said corrugating roller.

4,447,286

DIE AND METHOD OF MAKING SAME

Walter Weglin, Bellevue, Wash., assignor to Jerobee Industries, Inc., Redmond, Wash.

Filed Apr. 5, 1982, Ser. No. 365,368
Int. Cl.³ C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—515 **17 Claims**



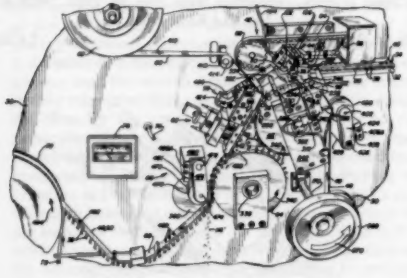
1. A method for making a die by chemical milling an etchable workpiece to form a pattern of raised die elements separated and bounded by recessed cavities, wherein intermediate stages of fabrication yield recessed cavities filled with etchant-resistant filler, said method comprising the step of depositing an underlayment film of an etchant-resistant composition between the etchable workpiece the etchant-resistant filler.

4,447,287

COMPONENT RETAPING MACHINE

John Hofbauer, Des Plaines, Ill., assignor to Die-Craft Metal Products, Inc., Des Plaines, Ill.

Division of Ser. No. 188,967, Sep. 19, 1980, Pat. No. 4,350,556.
This application Jul. 1, 1982, Ser. No. 394,288
Int. Cl.³ B65H *5/26*
U.S. Cl. 156—552 **7 Claims**



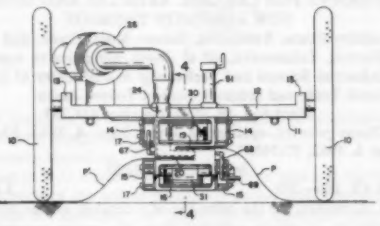
1. A machine for repackaging components, comprising:
means for receiving an input carrier having at least one component releasably secured thereto, said component including at least one lead;
a repackaging station;
means for advancing an output carrier strip length-wise through said repackaging station, said strip having a width smaller than the length of said component lead;
said strip advancing means including indexing means in juxtaposition with said strip and motive means for displacing said indexing means lengthwise of said strip;
means for removing said component from said input carrier and depositing it upon the portion of said strip which is juxtaposed to said indexing means;
means for securing said component to said strip;
means for advancing said strip in response to said displacement of said indexing member;
means, located adjacent the path of advancement of said strip and downstream of said repackaging station relative to the direction of said advancement, for forming sprocket holes in said strip at lengthwise-spaced locations thereon;
sprocket drive means located adjacent said path and downstream of said sprocket hole forming means relative to said direction of advancement, said sprocket drive means having sprocket pin means adapted to engage successive ones of said sprocket holes and means for displacing said sprocket pin means to assist in said advancement of said strip;
and means, located adjacent said path and downstream of said sprocket drive means relative to said direction of advancement, for severing said lead close to one edge of said strip.

4,447,288

SEAM WELDER FOR THERMOPLASTIC COATED FABRIC

Donald R. Seaman, Sarasota, Fla., assignor to Seaman Corporation, Millersburg, Ohio

Filed Jul. 30, 1982, Ser. No. 403,470
Int. Cl.³ B44C *7/00*
U.S. Cl. 156—574 **15 Claims**



1. A seam welding machine for thermally welding overlapping edge portions of coated fabric panels over uneven ground in the field, comprising a guiding head having slots which are open at their laterally outer ends and closed at their inner ends and extend inwardly from the opposite sides of the head to overlap each other past a longitudinal axis of the head for guiding overlapping edge portions of two panels into a nip area behind said head, a hot air welding tip directed into said nip area between said overlapping edge portions, upper and lower pressure rolls mounted behind said nip and upper and lower drive belts mounted behind said pressure rolls and drivably connected thereto to press said overlapping edge portions together into a seam, said machine behind said guiding head being laterally open in the plane of the said seam to allow unrestrained passage of panels of unrestricted width, and means for rollably supporting said machine with said overlapping guide slots close to the ground.

12. A seam welding machine for thermally welding overlapping edge portions of coated fabric panels, comprising a guiding head having slots which are open at their laterally outer ends and closed at their inner ends and extend inwardly from the opposite sides of the head to overlap each other past a longitudinal axis of the head for guiding overlapping edge portions of two panels into a nip area, a hot air welding tip directed into said nip area, upper and lower pressure rolls mounted behind said nip area and upper and lower drive belts mounted behind said pressure rolls and drivably connected thereto to press said overlapping edge portions together into a seam, said machine behind said guiding head being laterally open in the plane of the said seam to allow unrestrained passage of panels of unrestricted width, and means for rollably supporting said machine with said overlapping guide slots close to the ground, and further comprising a variable speed

motor for driving the upper drive belt and pressure roll, and a torque motor for driving the lower drive belt and pressure roll at a following speed matching the speed of the upper drive belt and pressure roll.

4,447,289

PROCESS FOR THE MANUFACTURE OF COARSELY CRYSTALLINE TO MONOCRYSTALLINE SHEETS OF SEMICONDUCTOR MATERIAL

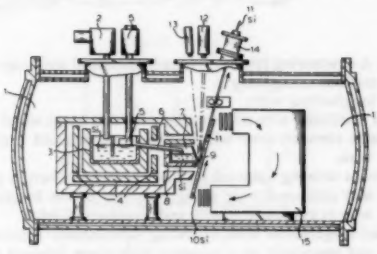
Joachim Geissler, Stammham, and Dieter Helmreich, Burghausen, both of Fed. Rep. of Germany, assignors to Heliotronic Forschungs-und Entwicklungsgesellschaft fur Solarzellen-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Jul. 12, 1982, Ser. No. 397,581

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1981, 3132776

Int. Cl.³ C30B *11/02, 15/12*

U.S. Cl. 156—608 **6 Claims**



1. In a process for the manufacture of coarsely crystalline to monocrystalline sheets of semi-conductor material of preferred orientation by applying molten semiconductor material to a substrate with subsequent controlled solidification and subsequent automatic release of the applied semiconductor material, the improvement comprising the steps of:

bringing molten semiconductor material into contact with a substrate of the same semiconductor material having the desired coarsely crystalline to monocrystalline structure, said substrate being guided past the point of contact at a speed of at least 75 mm/s; and

maintaining the substrate at a temperature of not more than 0.8 T_M, where T_M denotes the melting point of the semiconductor material expressed in degress Kelvin, so as to ensure the automatic release of the growing sheet.

4,447,290

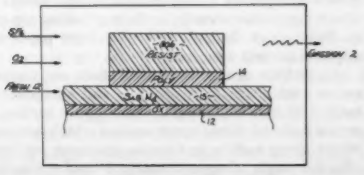
CMOS PROCESS WITH UNIQUE PLASMA ETCHING STEP

James A. Matthews, Santa Clara, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Division of Ser. No. 387,050, Jun. 10, 1982, Pat. No. 4,412,375. This application Jul. 25, 1983, Ser. No. 516,529

Int. Cl.³ H01L *21/306;* B44C *1/22;* C03C *15/00, 25/06*

U.S. Cl. 156—626 **1 Claim**



1. In the plasma etching of a polysilicon layer during the fabrication of an integrated circuit where SF_6 and O_2 are used for said etching, an improvement comprising:

adding C_nF_m to said SF_6 and O_2 during said plasma etching to provide better end point detection.

4,447,291

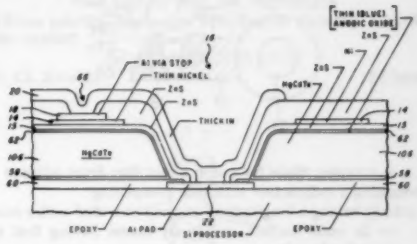
METHOD FOR VIA FORMATION IN HGCDTE

Eric Schulte, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 31, 1983, Ser. No. 528,206

Int. Cl.³ H01L *21/306;* B44C *1/22;* C03C *15/00, 25/06*

U.S. Cl. 156—643 **6 Claims**



1. A method for forming vias in HgCdTe, comprising the steps of:

ion milling a hole through said HgCdTe, said hole being substantially smaller than the desired diameter of said via; and

wet etching said HgCdTe, whereby said hole is enlarged to form a via having a desired size and smooth walls.

4,447,292

METHOD FOR MANUFACTURING UNSUPPORTED METAL LATTICE STRUCTURES

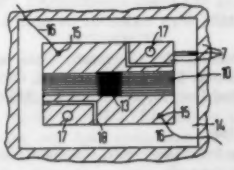
Hans Schuster-Woldan, Woerthsee/Steinebach; Hermann Buerk, Maisach; Dirk Koch, Augsburg, and Kaspar Weingand, Gmund, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 4, 1983, Ser. No. 455,595

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1982, 3204425

Int. Cl.³ C23F *1/02;* B44C *1/22;* C03C *15/00, 25/06*

U.S. Cl. 156—644 **4 Claims**



1. A method of manufacturing unitary unsupported metal lattice structures suitable for use as micro-flow sensors comprising the steps of:

generating a metal lattice structure on opposite sides of an insulating carrier by vapor-depositing a metal layer on said opposite sides of said carrier and subsequently removing congruent selected portions of said metal layer on each of said opposite sides thereof by photolithography; and

generating a passage in said carrier between said metal lattice structures by etching said carrier at selected locations.

4,447,293

SCRAPING BLADES FOR USE IN THIN FILM DRYERS

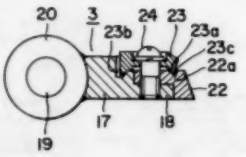
Masaru Watanabe, Fuchu; Satoru Matsumura, Tokyo; Takayoshi Amada, Yokohama; Hiromitsu Irie, Higashimine, and Norihisa Saito, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Continuation-in-part of Ser. No. 194,403, Oct. 6, 1980, abandoned. This application Jul. 8, 1982, Ser. No. 396,398

Claims priority, application Japan, Oct. 11, 1979, 54-129835; Jul. 23, 1980, 55-99850

Int. Cl.³ B01D *1/24*; A47L *13/08*

U.S. Cl. 159—6.2 5 Claims



1. A scraping blade for use in a thin film dryer adapted for processing a radioactive substance comprising:

a body having a longitudinal axis and provided with a recess on its outer surface, said body recess having first and second sidewalls;

hinge means rigidly attached to one side of said body for pivoting about an axis parallel to the longitudinal axis of said body, said hinge means being adapted to be pivotably connected to a rotor in a thin film dryer;

a blade chip attached to the other side of said body for engaging the radioactive substance to thereby cause it to be extended over a heating surface of the thin film dryer, said blade chip being provided with a recess on its outer surface, said blade chip recess having first and second sidewalls;

screw means engaged with said body to operatively secure said blade chip to said body; and

means for engagement with said screw means, said engagement means having two sides and edge portions on both said sides which are respectively engaged with one of said sidewalls of said body recess and one of said sidewalls of said blade chip recess with a clearance being provided between said edge portions and the other of said sidewalls of said body recess and the other of said sidewalls of said blade chip recess.

4,447,294

PROCESS FOR MAKING ABSORBENT TISSUE PAPER WITH HIGH WET STRENGTH AND LOW DRY STRENGTH

Thomas W. Osborn, III, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 30, 1981, Ser. No. 335,497

Int. Cl.³ D21H *3/02*

U.S. Cl. 162—158 8 Claims

1. A process for making soft, absorbent tissue paper webs comprising the steps of:

(a) providing a papermaking furnish comprising papermaking fibers and from about 0.25% to about 3% by weight of said fibers of at least one wet strength resin;

(b) forming a wet fibrous web from said papermaking furnish;

(c) drying said web until said web contains not more than about 20% by weight moisture;

(d) at least partially curing said wet strength resin in said web; and

(e) incorporating into said web from about 0.1% to about 2.5% by weight of said fibers of at least one cationic, nitrogenous debonding agent.

4,447,295

DEWATERING APPARATUS FOR LONGITUDINAL WIRE PAPERMAKING MACHINES

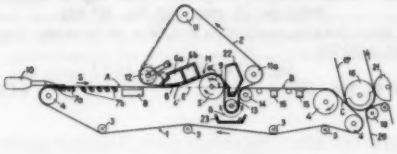
Alfred Bubik; Hans Dahl; Herbert Holik, all of Ravensburg; Rüdiger Kurtz, Immenstaad, and Werner Seider, Ravensburg, all of Fed. Rep. of Germany, assignors to Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Jun. 28, 1982, Ser. No. 392,622

Claims priority, application Switzerland, Jul. 24, 1981, 4824/81

Int. Cl.³ D21F *1/36*, *1/40*

U.S. Cl. 162—300 14 Claims



1. A dewatering apparatus for a longitudinal wire papermaking machine comprising:

a longitudinal wire;

an additional wire cooperating with said longitudinal wire;

guide elements over which there is guided said additional wire;

means defining a domed surface over which there is guided said additional wire along a section of the longitudinal wire in conjunction with said longitudinal wire;

said longitudinal wire extending substantially horizontally and essentially in a common wire plane forward of the guide elements and after the means defining the domed surface; and

said means defining said domed surface upwardly rising past the common wire plane.

4,447,296

DOUBLE NIP HYDROFOIL

Aubrey R. Cruse, Pasadena, Tex., assignor to Champion International Corporation, Stamford, Conn.

Filed Mar. 29, 1982, Ser. No. 363,234

Int. Cl.³ D21F *1/54*

U.S. Cl. 162—312 1 Claim

1. A paper forming apparatus having a paper forming wire which moves from upstream to downstream sides of said apparatus, said apparatus further comprising a series of hydrofoils disposed below said wire and over which said wire passes, and wherein:

(a) alternate ones of said hydrofoils include a planar upper surface and an upstream planar surface which intersects said planar upper surface at an angle which is less than 90° whereby the upstream ends of said alternate hydrofoils are devoid of a leading nip, and said alternate hydrofoils further comprising an upper downstream planar surface which tapers downwardly to form a trailing nip operable to draw water through said wire from paper material disposed on said wire; and

(b) intermediate ones of said hydrofoils are disposed between said alternate hydrofoils, and said intermediate hydrofoils each including a planar upper surface, an upstream inclined planar upper surface which intersects said planar upper surface to form an upstream nip having an effective angle of approximately 3° and a length of approximately 1.5 inches on said intermediate hydrofoils operable to pump water from the underside of said wire

through said wire and into paper material disposed on said wire to break up and redisperse flocs formed in the paper material, said intermediate hydrofoils further comprising an upper downstream planar surface which tapers downwardly to form a trailing nip operable to draw the water pumped by said upstream nip back through said wire from the paper material disposed on said wire.

4,447,297

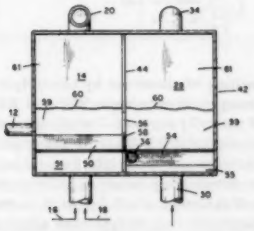
COMBINED FLUIDIZED BED RETORT AND COMBUSTOR

Jer-Yu Shang, Fairfax, Va.; John E. Notestein, Morgantown, W. Va.; Joseph S. Mei, Morgantown, W. Va., and Li-Wen Zeng, Morgantown, W. Va., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 14, 1982, Ser. No. 368,197

Int. Cl.³ C10B *1/06, 49/10, 49/22*

U.S. Cl. 202—99 **3 Claims**



1. A combined fluidized bed retorting and combustion apparatus comprising a housing, vertically oriented partition means within said housing for dividing the housing into side-by-side volumes, perforated fluid distribution means in each of said volumes disposed essentially normal to said partition means for dividing each volume into lower and upper chambers with one of said upper chambers defining a retorting chamber and the other of said upper chambers defining a combustion chamber, said fluid distribution means providing for the distribution of fluidizing medium from the lower chambers into the retorting chamber and the combustion chamber through perforations in the fluid distribution means to fluidize solid fluidizable material and thereby create a fluidized bed in said retorting chamber and said combustion chamber, first conduit means penetrating said housing and in registry with said retorting chamber for conveying the solid fluidizable material thereinto, further conduit means penetrating said housing and in registry with said combustion chamber for removing solid material therefrom, first passageway means through said partition means at a location above the distribution means for placing the retorting chamber in registry with the combustion chamber, second passageway means extending through said partition means for recycling solid fluidizable material from the combustion chamber into the retorting chamber, with said second passageway means being disposed at a location in the housing adjacent to said further conduit means, the first passageway means extending through the partition means at a location remote to said second passageway means and at a location corresponding to essentially the full length of travel of the solid fluidizable material through said retorting chamber and both said first and second passageway means extending through said partition means at locations below the upper level of the fluidized bed to inhibit admixture of gases between said retorting chamber and said combustion chamber, said distribution means being inclined at an angle to the horizontal from the highest point adjacent to the first conduit means towards a lowest point adjacent to said further conduit means with said angle being adequate for effecting displacement of solid fluidizable material from within said retorting chamber through said combustion chamber via said first passageway means.

4,447,298

METHOD OF OPERATING AN ELECTROPLATING SYSTEM

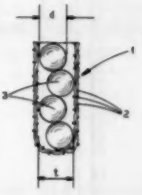
Joachim Betschler, Eckental, Fed. Rep. of Germany, assignor to Holl & CIE GmbH, Nürnberg, Fed. Rep. of Germany

Filed Sep. 22, 1981, Ser. No. 304,373

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1980, 3036937

Int. Cl.³ C25D *5/00, 17/12*

U.S. Cl. 204—23 **2 Claims**



1. A method of operating an electroplating system which comprises the steps of:

(a) cutting successive sections from a cylindrical wire of a metal to be electrodeposited to form cylindrical blanks;

(b) pressing said blanks to form therefrom individual anode bodies of said metal having a diameter of 5 to 30 mm;

(c) introducing anode bodies made in step (b) and all of the same diameter into an anode basket, the bodies which are introduced into said basket being selected to have a diameter greater than half the diameter of said basket but less than the diameter of said basket;

(d) immersing said basket in an electroplating bath in juxtaposition with a cathode upon which said metal is to be plated; and

(e) electrodepositing said metal on said cathode from said bath.

4,447,299

USE OF ALCOHOL FOR INCREASING THE CURRENT EFFICIENCY OF CHROMIUM PLATING

Arash S. Kasaaian, and John Dash, both of Portland, Oreg., assignors to State of Oregon Acting by and Through the State Board of Higher Education on behalf of Portland State University, Portland, Oreg.

Filed Jun. 15, 1982, Ser. No. 388,536

Int. Cl.³ C25D *3/10, 3/56*

U.S. Cl. 204—43 R **5 Claims**

1. In the electrolytic process of chromium plating an article by the electrodeposition of chromium from an aqueous bath solution containing dissolved CrO_3 electrolyte, the improvement comprising, with a bath solution containing metallic cations limited to the group consisting of chromium and iron, enhancing current efficiency by including in said bath solution methyl alcohol, in an amount within the range of from 0.25 mls to 80 mls of alcohol/l. of bath solution.

4,447,300
ELECTRODE HOLDER FOR USE IN FUSION ELECTROLYSIS

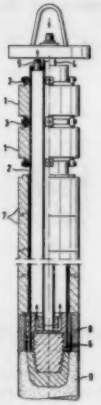
Dieter H. Zöllner, Schwaig b. Nürnberg; Inge Lauterbach-Dammler, Nuremberg, and Friedrich Rittmann, Rückersdorf b. Nürnberg, all of Fed. Rep. of Germany, assignors to C. Conradty Nurnberg GmbH & Co. Kg, Röthenbach, Fed. Rep. of Germany

Filed Aug. 25, 1982, Ser. No. 411,433

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1981, 3135912

Int. Cl.³ C25C 7/02, 3/02, 3/04, 3/06

U.S. Cl. 204—67 27 Claims



1. An electrode holder for fusion electrolysis for the electrolytic production of inter alia aluminum, magnesium, sodium and lithium, in which the holder is clamped by clamping jaws for current supply, the holder comprising: an elongate metal element; cooling means internally of said metal element, said cooling means comprising an inflow channel and a return channel for a cooling medium; connection means on said metal element for mechanical and electrical connection to an active electrode element of consumable or non-consumable material; and external contact elements of pressure-resistant material carried by said metal element for detachable mechanical and electrical connection to said clamping jaws, the contact elements providing a plurality of contact sites at axially displaced positions to allow axial adjustment of the holder relative to said clamping jaws.

26. Fusion electrolysis apparatus comprising: clamping means; an electrode holder clamped by said clamping means; and an active electrode element of consumable material held by said electrode holder, wherein said electrode holder comprises:

(a) an elongate metal element;

(b) connection means on said element connected electrically and mechanically to said electrode element;

(c) external contact elements at least one of which is clamped by said clamping means; and

(d) said contact elements providing a plurality of contact sites at axially displaced positions to allow axial adjustment of said holder relative to said clamping means.

27. A method of operating the apparatus of claim 26 during fusion electrolysis in which when said electrode element has been consumed by an amount corresponding to the axial spacing of said contact sites the electrode holder is axially displaced relative to said clamping means to the next adjacent contact site to readjust the position of said electrode element.

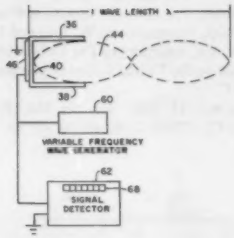
4,447,301
SONIC RESONATOR CONTROL AND METHOD FOR DETERMINING COMPONENT CONCENTRATION IN MULTIPLE COMPONENT MOLTEN LIQUIDS

Sin-Yan Shen, Woodridge, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 29, 1982, Ser. No. 437,783

Int. Cl.³ C25C 3/20, 3/00; G06F 15/46; G06G 7/58

U.S. Cl. 204—67 8 Claims



7. In the smelting of aluminum by electrolysis of a molten electrolyte at temperatures between 950° and 1000° C., where alumina would normally start at 6–7 wt.% concentration of the electrolyte and decline to 2.2–0.5 wt.% concentration near the end of the cycle where an anode effect would begin, a method for accurately determining when a predetermined alumina concentration of the order of 2.7–2.5 wt.% is reached to provide for recharging the electrolyte with alumina before any anode effort might actually begin, comprising the steps of submerging a sonic resonator in the electrolyte at a representative level thereof, periodically exciting the resonator throughout a range of frequencies through and including the resonant frequency of the resonator in the electrolyte, detecting for each excitation of the resonator the instantaneous resonant frequency thereof, correlating this against a data base calibration of the resonator at known alumina concentration throughout the smelting cycle, whereby the instantaneous resonant frequency effectively can provide the instantaneous alumina concentrations during the smelting cycle so as to allow the identification thereof when said alumina concentration reaches said predetermined alumina concentration.

4,447,302
HIGHLY POROUS ELECTRODES HOT PRESSED FROM NICKEL POWDER FOR ALKALINE WATER ELECTROLYZERS

Peter W. R. Brennecke, Braunschweig; Henning Ewe, Hamburg, and Eduard W. Justi, Braunschweig, all of Fed. Rep. of Germany, assignors to Bomin Bochumer Mineralol GmbH & Co., Fed. Rep. of Germany

Filed Mar. 1, 1982, Ser. No. 352,886

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1981, 3109183

Int. Cl.³ H01M 4/88; C25B 11/06

U.S. Cl. 204—128 10 Claims

1. A highly porous electrode, hot pressed from nickel powder for alkaline water electrolysers, which is coated on its internal and external surfaces with a layer comprising a mixed Ni-Ti oxide having a thickness of 0.0025–0.1 μm (10–100 Molecular layers).

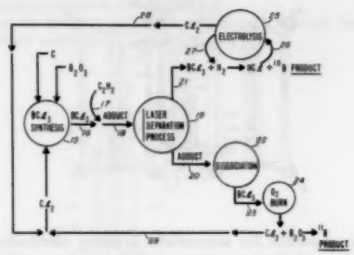
4. The method of electrolyzing an alkaline water solution using the electrode of claim 1.

4,447,303

METHOD OF SEPARATING BORON ISOTOPES

Reed J. Jensen, Los Alamos, N. Mex.; James M. Thorne; Coran L. Cluff, both of Provo, Utah, and John K. Hayes, Salt Lake City, Utah, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 23, 1981, Ser. No. 228,036
Int. Cl.³ B01D *59/00*
U.S. Cl. 204—157.1 R 12 Claims



1. A method of enriching boron in a particular isotope thereof which comprises:

(a) irradiating gaseous HClC=CHBCl$_2$ containing both boron isotopes with radiation of a wavelength which at least preferentially excites those molecules containing a particular boron isotope and a fluence sufficient to photodissociate those molecules thus excited, and

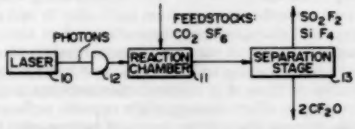
(b) separating the undissociated HClC=CHBCl$_2$ from the products of said photodissociation.

4,447,304

PRODUCTION OF CARBONYL FLUORIDE

Vincenzo Malatesta; Clive Willis, and Peter A. Hackett, all of Ottawa, Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Filed Feb. 22, 1982, Ser. No. 350,742
Claims priority, application Canada, May 15, 1981, 377708
Int. Cl.³ B01J *19/12*
U.S. Cl. 204—157.1 R 2 Claims



1. A method of producing carbonyl fluoride by multiphoton decomposition of carbon dioxide-sulphur hexafluoride mixtures comprising:

(a) irradiating gaseous carbon dioxide-sulphur hexafluoride mixtures in a reaction chamber at a pressure in the 10–50 Torr range with a laser beam at a frequency of about 944 wavenumbers causing the following reaction to take place:

$$SF_6 + 2\,CO_2 \xrightarrow{\text{photons}} 2\,CF_2O + SO_2F_2$$

and

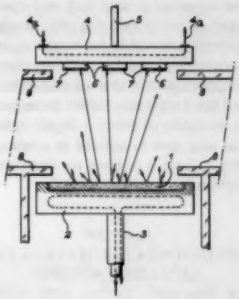
(b) passing the material from the reaction chamber after irradiation through a chemical processing stage to obtain a carbonyl fluoride product.

4,447,305

PROCESS FOR OBTAINING LUMINESCENT GLASS LAYERS

Rudolf Heindl, Fontenay-aux-Roses, and André Robert, Le Mesnil Saint Denis, both of, France, assignors to Commissariat a l'Energie Atomique and Centre National de la Recherche Scientifique, both of Paris, France

Filed Apr. 12, 1982, Ser. No. 367,390
Claims priority, application France, Apr. 15, 1981, 81 07566
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 C 9 Claims



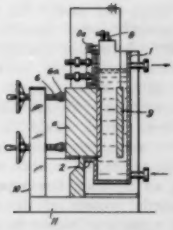
1. Process for producing a photoscintillator, comprising projecting onto a support, by cathodic sputtering, the material of a target containing silica and at least one chemical compound able to give luminescent centers, in such a way as to form on said support a scintillating glass layer able to emit light by energy absorption, said support being transparent to said light and having a polished face and a frosted face, said scintillating glass layer being deposited on the frosted face and optically coupled to the entrance window of a photodetector by means of the polished face.

4,447,306

PLATING APPARATUS

Tetsuji Ushio, Fukuoka; Satoru Tatsuguchi, Chiba; Toshihisa Otani, Fukuoka; Hoshiro Tani, Fukuoka, and Tetsuo Yabe, Fukuoka, all of Japan, assignors to Mishima Kosan Corporation, Fukuoka, Japan

Filed Jan. 20, 1982, Ser. No. 340,908
Claims priority, application Japan, Jan. 28, 1981, 56-012033
Int. Cl.³ C25D *17/02, 17/06*
U.S. Cl. 204—224 R 6 Claims



1. Plating apparatus for plating a portion of an object, comprising a plating tank having a bottom and side walls extending upwardly from said bottom, an anode disposed in said plating tank and electrically connected to said object, one of said side walls having a cutout section, said cutout section having a lower edge and two side edges, a supporting holder along said lower edge for supporting said object in a position juxtaposed

to said cutout section, a top plate disposed on top of said object and extending between said two side edges of said cutout section, sealing means along said two side edges and along said supporting holder for providing a seal between said tank and said object and between said tank and said top plate, said sealing means also extending between said top plate and said object to provide a seal between said top plate and said object, a base on which said tank is disposed, an upright support extending from said base, first adjustable set screw means on said upright support operable to engage said object and to move said object horizontally toward said tank, a second adjustable set screw means mounted in said tank and operable to engage said top plate and to move said top plate horizontally toward said tank, and third adjustable set screw means mounted on said tank and operable to engage said top plate and move the latter vertically downwardly toward said object, whereby said first, second and third set screw means in cooperation with said seal means are operable to effect a liquid-tight seal such that plating liquid in said tank is utilized in conjunction with said anode in plating at least a portion on one side of said object which is disposed in said cutout section.

4,447,307

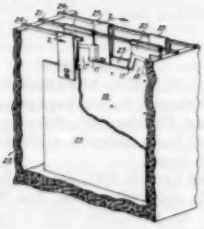
ELECTROWINNING CELL HAVING PARTIALLY SHIELDED ANODES

Larry A. Davis, Box 1047, Kearny, Ariz. 85237; Gregory H. Boyce, 6114 E. Hannibal St., Mesa, Ariz. 85205; Timothy P. Mulloy, Box 1484, Kearny, Ariz. 85237; Neil J. Nebeker, Box 969, Kearny, Ariz. 85237; Elmer C. Newman, Box 1484, Kearny, Ariz. 85237; Donald J. Quinn, Queen Valley, Apache Junction, Ariz. 85220, and David L. Adamson, 5839 Stanida Cir., Salt Lake City, Utah 84121

Filed Dec. 15, 1982, Ser. No. 450,136

Int. Cl.³ C25C *7/00*; C25D *17/06*

U.S. Cl. 204—267 **11 Claims**



1. In an electrowinning cell utilizing suspended anode-cathode pairs having broad-area suspension members extending upwardly from the main bodies of respective, mutually spaced anodes and cathodes wherein the anodes and the suspension members thereof are such as to cause uneven cathode-current distribution and irregular metal deposits on the suspension members and upper margins of the cathodes, the improvement comprising respective, partial, anode shields applied to and carried by respective anode suspension members adjacent to upper margins of the anode bodies, each of said partial anode shields comprising an electrical-flux-impervious, electrically non-conductive material protectively covering only that portion of a suspension member adjoining the upper margin of the main body of the anode and which is within the area of electrical flux, and each of said partial anode shields having at least one electrical-flux-pervious, electrically conductive opening which is appropriately positioned in the anode shield and is of proper shape and size to permit sufficient current flux to flow to the paired cathode, when suspended in an electrowinning cell of the type specified, to induce a uniform current distribution on the upper portions of the cathode.

4,447,308

ELECTRODE BRUSHING APPARATUS

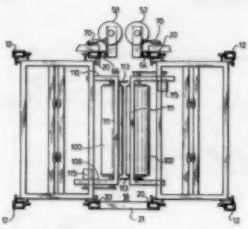
Robert D. H. Willans, Trail, Canada, assignor to Cominco Ltd., Vancouver, Canada

Filed May 18, 1983, Ser. No. 495,842

Claims priority, application Canada, Jun. 17, 1982, 405419

Int. Cl.³ C25D *17/10*, *21/00*; A47L *25/00*

U.S. Cl. 204—279 **10 Claims**



1. An apparatus for sequentially brushing electrodes, said electrode each having opposite planar surfaces with areas having solution lines thereon, a head bar including lifting lugs, vertical side edges having permanent edge sticks mounted on said side edges, and a bottom edge, which apparatus comprises: a frame for supporting first and second brushing mechanisms and having a passage extending therethrough a conveyor for suspending and sequentially passing said electrodes through the passage in said frame in proximity to said brushing mechanisms; said first brushing mechanism comprising two pivotally mounted, vertically positioned, rotatable auxiliary brushes in opposing positions for brushing electrodes on the areas of said opposite surfaces below and in proximity to the head bar, said areas including the solution lines; means to rotate said auxiliary brushes; means to pivot said auxiliary brushes towards and away from electrodes such that when pivoted towards an electrode the rotating auxiliary brushes effect cleaning of both the solution line areas over the width of each electrode; a second brushing mechanism comprising two main brush carriages disposed in opposing positions on each side of said passage within said frame, means to index the suspended electrodes sequentially in a stationary position between said carriages, each carriage being mounted for vertical reciprocal travel in unison with the other, a pair of horizontal rotatable main brushes pivotally mounted on said brush carriages in opposing relationship and said main brushes being adapted to be pivoted towards and away from each other in said passage to engage and disengage opposite surfaces of an electrode in said passage; means to rotate said main brushes; means for vertically reciprocating said carriages, said brushes engaging the opposite surfaces of an electrode therebetween during said reciprocating to effect cleaning of the opposite surfaces of the electrode between the solution lines and bottom edge thereof; and means to de-index electrodes and pass electrodes on said conveyor from the brushing apparatus.

4,447,309

PH SENSOR

Akihiro Morioka; Yuji Maeda; Tetsuro Matsumoto; Masakazu Yukinari, and Eiichi Kishida, all of Tokyo, Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Aug. 9, 1982, Ser. No. 406,513

Claims priority, application Japan, Oct. 7, 1981, 56-159707

Int. Cl.³ G01N *27/30*, *27/38*

U.S. Cl. 204—402 **11 Claims**

1. A pH sensor comprising

a sleeve assembly having a side wall and defining at least first and second spaces, a partition providing water tight separation between said first and second spaces, and a flange projecting outwardly from said side wall;

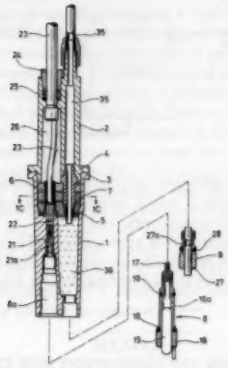
a reference electrode comprising an electrolytic solution accommodated in said first space, an inner electrode, and a liquid junction positioned at one end of said sleeve assembly;

a glass electrode comprising a sensor unit, disposed adjacent to said liquid junction;

liquid grounding means disposed adjacent to said liquid junction;

cable means inserted through an opening formed at the other end of said sleeve assembly and electrically connected to said reference electrode, said glass electrode, and said liquid grounding means; and

means for holding said cable means with a water tight seal within said second space; wherein



said sleeve assembly further defines a first cavity and a second cavity; annd wherein said glass electrode is replaceably disposed within said first cavity, and said liquid junction is replaceably disposed within said second cavity.

8. The sensor according to claim 1, including a cleaning unit means comprising a cleaning unit having a cleaning member on its distal end, an attachment having a through passageway therein and detachably connected to said cleaning unit, and means for supplying power for driving said cleaning member through said through passageway in said attachment, said cleaning unit being positioned in confronting relation to said sensor unit, whereby said sensor unit is cleanable by said cleaning unit.

4,447,310

PRODUCTION OF DISTILLATES BY THE INTEGRATION OF SUPERCRITICAL EXTRACTION AND GASIFICATION THROUGH METHANOL TO GASOLINE

Francis J. Derbyshire, Ewing, and Darrell D. Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 23, 1982, Ser. No. 391,334
Int. Cl.³ C10G *1/00*; C07C *1/00, 27/06*
U.S. Cl. 208—8 LE **17 Claims**

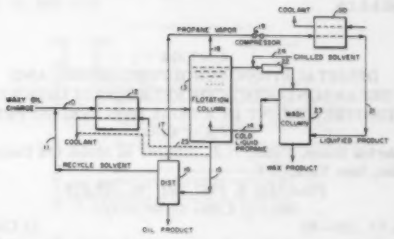
1. An integrated process for the conversion of solid coal to a wide slate of fuel products comprising: extracting a portion of said coal by contacting said coal with an extraction solvent under supercritical conditions of temperature and pressure whereby said solvent is converted to a dense-gas phase capable of dissolving the coal, separating said solvent and a hydrogen-rich liquid coal extract, said coal extract having a hydrogen concentration greater than said solid coal, a portion of said solid coal remaining an unsolvated, solid coal residue, upgrading at least a portion of said coal extract in the presence of hydrogen to produce a plurality of upgraded fuel products, gasifying said residue under oxidizing conditions to produce a synthesis gas comprising hydrogen and carbon monoxide, shifting the hydrogen to carbon monoxide ratio of a portion of said synthesis gas to produce a hydrogen-enriched gas, combining said hydrogen-enriched gas with said synthesis gas, converting said combined gas to methanol, passing at least a portion of said methanol in contact with a catalyst capable of converting said methanol to gasoline products and recycling at least a portion of said gasoline products for use as said extraction solvent.

4,447,311

DEWAXING PROCESS

Patrick E. Fowles, Doylestown; Gerald L. Shoemaker, Yardley, and Tsoung-Yuan Yan, Philadelphia, all of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 22, 1982, Ser. No. 400,841
Int. Cl.³ C10G *73/06, 73/26*
U.S. Cl. 208—35 **20 Claims**



1. A dewaxing process for producing dewaxed oil from waxy oil which comprises:

contacting in a flotation column the waxy oil with a liquid autorefrigerant to cool the oil by vaporization of the autorefrigerant thereby causing crystallization of wax from the oil, and separating the wax from the oil by flotation to produce wax crystals and dewaxed oil wherein most of the wax separated from the oil by flotation is crystallized by vaporation of said liquid autorefrigerant and removed from an upper portion of said column wherein said dewaxed oil is removed from said column as a separate stream, substantially free of wax crystals, from a withdrawal point below the point of removal of said wax crystals.

4,447,312

PROCESS FOR IMPROVING THE DIESEL FUEL QUALITY OF COAL DERIVED LIQUIDS

Philip J. Angevine, West Deptford; Costandi A. Audeh, Princeton; Samuel A. Tabak, Wenonah, all of N.J., and Tsoung Y. Yan, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 19, 1982, Ser. No. 340,662
Int. Cl.³ C10G *11/05*
U.S. Cl. 208—46 **28 Claims**

1. A process for improving the quality of light fuel oil derived by the direct liquefaction of coal having a low cetane number, said process comprising the steps of:

(i) contacting said light fuel oil liquid with an olefin having at least three carbon atoms under alkylation conditions.

4,447,313

DEASPHALTING AND HYDROCRACKING

Robert L. Gorring, Washington Crossing, Pa., and Robert L. Smith, Hopewell, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 1, 1981, Ser. No. 326,259
Int. Cl.³ C10G *67/04, 45/12*
U.S. Cl. 208—86 **3 Claims**

1. A two-stage process for preparing from 650° F.+ residual oils a feed suitable for subsequent catalytic processing which meets heavy metals requirements for fluid catalytic cracking feedstocks comprising first pentane deasphalting the oils at room temperature thereby removing substantially all of the refractory heavy metals and thereafter removing any remaining metal by subjecting the treated 650° F.+ oil in the presence of a ZSM-5 type catalyst to mild hydrocracking conditions which include temperatures ranging from about 700° to about 825° F., pressures ranging from about 500 to about 1250 psi, liquid hourly space velocities ranging from about 0.5 to about 2 and a hydrogen feed rate ranging from about 1000 to about 5,000 s.c.f.b.

4,447,314

DEMETALATION, DESULFURIZATION, AND DECARBONIZATION OF PETROLEUM OILS BY HYDROTREATMENT IN A DUAL BED SYSTEM PRIOR TO CRACKING

Frederick Banta, Elmer, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 5, 1982, Ser. No. 375,079
Int. Cl.³ C10G *65/04, 65/12*
U.S. Cl. 208—89 **12 Claims**

1. In the preparation of suitable feed stocks for catalytic cracking, an improved process for reducing Conradson carbon content, metals content, and sulfur content in residual oils in order to convert said oils into said suitable feed stocks, comprising:

A. passing a mixture of hydrogen and said oils at hydrogen pressure of about 500 to 3000 psig, a temperature of about 600° to 850° F., and a space velocity of 0.1 to 5.0 LHSV, through a trickle bed of first catalyst, said first catalyst comprising the oxides or sulfides of a Group VIB metal and an iron group metal on a support comprising a delta or theta phase alumina, said first catalyst having also at least about 60 percent of its pore volume in pores with diameters of about 100 to 200 A, at least about 5 percent of its pore volume in pores greater than 500 A, and a surface area of up to about 110 m^2/g; and

B. then passing said mixture of hydrogen and said oils through a bed of second catalyst disposed downstream of said first catalyst, said second catalyst comprising the oxides or sulfides of a Group VIB metal and an iron group metal on an alumina support, said second catalyst having a surface area of at least 150 m^2/g, a quadrulobe shape, and at least 50 percent of its pore volume in pores with diameters of 30 to 100 A.

4,447,315

HYDROCRACKING PROCESS

Paul R. Lamb, Lake Bluff; Steve T. Bakas, Palos Hills, both of Ill., and Brian M. Wood, Sasolburg, South Africa, assignors to UOP Inc., Des Plaines, Ill.

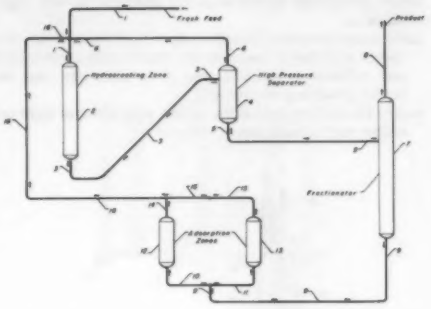
Filed Apr. 22, 1983, Ser. No. 487,797
Int. Cl.³ C10G *67/06, 25/03*
U.S. Cl. 208—99 **8 Claims**

1. A catalytic hydrocracking process which comprises:

(a) contacting a hydrocarbon feedstock having a propensity to form polynuclear aromatic (PNA) compounds in a hydrocracking zone with added hydrogen and a metal promoted crystalline zeolite hydrocracking catalyst at elevated temperature and pressure sufficient to give a substantial conversion to lower boiling products;

(b) condensing the hydrocarbon effluent from said hydrocracking zone and separating the same into a low boiling hydrocarbon product and unconverted hydrocarbon oil boiling above about 650° F. and containing trace quantities of polynuclear aromatic compounds:

(c) contacting at least a portion of said unconverted hydrocarbon oil containing polynuclear aromatic compounds with an adsorbent which selectively retains said polynuclear aromatic compounds; and



(d) recycling unconverted hydrocarbon oil having a reduced concentration of polynuclear aromatic compounds resulting from step (c) to said hydrocracking zone.

4,447,316

COMPOSITION AND A METHOD FOR ITS USE IN DEHYDROCYCLIZATION OF ALKANES

Waldeen C. Buss, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 1, 1982, Ser. No. 344,571
Int. Cl.³ C10G *35/06*
U.S. Cl. 208—138 **21 Claims**

1. A method of reforming hydrocarbons comprising contacting said hydrocarbons with a catalyst comprising:

(a) a type L zeolite;

(b) at least one Group VIII metal; and

(c) an alkaline earth metal selected from the group consisting of barium, strontium and calcium, wherein said catalyst is reduced in a hydrogen atmosphere at a temperature of from 480° C. to 620° C.

4,447,317

HYDROPROCESSING WITH LITHIUM-CONTAINING CATALYST

J. Wayne Miller, Yorba Linda, and Howard D. Simpson, Irvine, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 314,526, Oct. 26, 1981, Pat. No. 4,394,302.
This application May 5, 1983, Ser. No. 491,896
Int. Cl.³ C10G *45/04*
U.S. Cl. 208—216 R **20 Claims**

1. A method for hydroprocessing a hydrocarbon feedstock which comprises contacting said feedstock with hydrogen under conditions of elevated temperature and pressure in the presence of a catalytic composition comprising metallic hydrogenation components on a material comprising a lithium-containing refractory oxide, said lithium-containing refractory oxide having been calcined at a temperature greater than about 1,200° F. to produce a lithium-containing refractory oxide having an increased average pore diameter as compared to said lithium-containing refractory oxide without lithium, said composition having an average pore diameter above about 100 angstroms.

4,447,318
EXTRACTIVE DISTILLATION METHOD

Shunichiro Ogura, Tokyo, and Masafumi Miyamoto, Ami, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1983, Ser. No. 479,725
Claims priority, application Japan, Mar. 29, 1982, 57-50688
Int. Cl.³ C10G *7/08, 7/00;* B01D *3/00, 3/40*
U.S. Cl. 208—348 7 Claims

1. In a method for separating a hydrocarbon mixture into relatively difficultly soluble hydrocarbons and relatively easily soluble hydrocarbons by extractive distillation using a polar solvent comprising feeding the starting hydrocarbon mixture through at least two evaporators, an extractive distillation column, a stripping column and a rectifying column; the improvement wherein

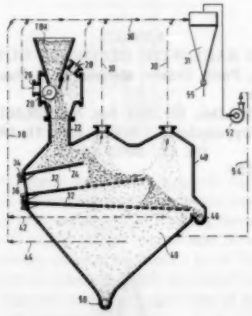
(1) the polar solvent discharged at a high temperature from the bottom of the stripping column is recycled to the extractive distillation column after it has been cooled to a suitable temperature by giving up heat to a reboiler of the extractive distillation column, a reboiler of the rectifying column and successively to the evaporators, and

(2) the starting hydrocarbon mixture is divided into at least two streams and heated in at least two evaporators, one stream being evaporated in a first evaporator to a pressure necessary for introduction into the extractive distillation column and then fed to the extractive distillation column, and the other stream after evaporation in a second and subsequent evaporator, being pressurized to a pressure required for introduction into the extractive distillation column by means of a compressor and then fed to the extractive distillation column.

4,447,319
PROCESS FOR SEPARATING SAND FROM A BROWN COAL OR LIGNITE MATERIAL CONTAINING SAND

Paul Lazik, Cologne, Fed. Rep. of Germany, assignor to Rheinische Braunkohlenwerke AG, Cologne, Fed. Rep. of Germany

Filed Jun. 30, 1982, Ser. No. 393,727
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1981, 3126585
Int. Cl.³ B07B *9/02*
U.S. Cl. 209—11 14 Claims

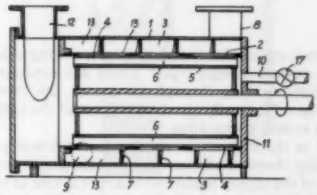


1. A process for separating sand from a brown coal material containing sand, the sand content of which is at least predominantly in a grain size range which covers only a part of the grain size range of the brown coal, with the grain size of the coarsest grains of the sand to be removed being markedly below the grain size of the coarsest grains of the brown coal, comprising carrying out at least one gaseous classifying operation to remove from said material the brown coal in the grain size range which is between zero and at least the grain size corresponding to the maximum grain size of the sand to be removed, and subjecting the remaining material to a sieving operation, the cut-off line of which is in the region of the grain size of the coarsest grains of the sand to be removed.

4,447,320
DEVICE FOR CLEANING AND RECOVERING PAPER PULP

Jean-Pierre J. Lamort, Saint Lumier en Champagne, France, assignor to E et M Lamort, Vitry le Francois, France

Continuation-in-part of Ser. No. 162,647, Jun. 24, 1980. This application Jan. 21, 1982, Ser. No. 341,247
Claims priority, application France, Jan. 23, 1981, 81 01236
Int. Cl.³ B07B *1/20*
U.S. Cl. 209—273 6 Claims



1. A cleaning and recovery device for paper pulp comprising:

a closed tank with first and second end walls, said tank being chargeable with contaminated pulp material to be washed;

a fixed cylindrical sieve (2) with perforations located within and separating the tank into inner and outer chambers (3 and 4);

a rotor (5) drum situated within the inner chamber and provided with longitudinal blades or vanes (6) moving within and extending to the vicinity of the sieve along substantially its entire effective length, the perforations of said sieve having a form splayed towards the inner chamber and dissymetrical, the perforations having a radial wall at the remote edge of the perforation in the direction of rotation of the blades or vanes, said blade having a sloped surface facing in its direction of rotation, the sloped surface directing the material moving with the blades or vanes in the inner chamber against the radial walls of the perforations such that the material in the outer chamber moves in a direction opposite to the movement of the blades or vanes;

a helical wall located in the outer chamber (3) between the sieve (2) and the tank (1) so as to provide said outer chamber (3) with the shape of a helical channel which is wrapped around the sieve along its length;

a pulp inlet (8) at one end of the helical channel and a refusals outlet (9) at the other end;

a cleaned pulp outlet (12) at the first end wall of said inner chamber (4); and

closing-off means (14) for stopping the flow of material through said helical channel to retain the refusals at a dead end of the inner chamber upstream thereof for selected time intervals so as to concentrate the refusals material and periodically discharge it, said rotor blades generating substantially uniform and continuous washing turbulence across the sieve between said pulp inlet and said refusals outlet, which turbulence draws acceptable pulp material across the sieve to the inner chamber and moves the remainder in the helical channel towards the refusals outlet.

4,447,321

LIQUID DRAIN SYSTEM

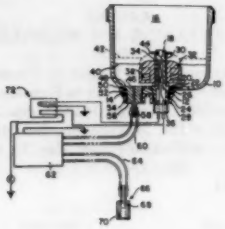
Henry D. Jackson, P.O. Box 475, Somerset West, 7130, South Africa

Filed Sep. 30, 1982, Ser. No. 430,325

Claims priority, application South Africa, Mar. 29, 1982, 82/2141

Int. Cl.³ B03D 3/00

U.S. Cl. 210—86 6 Claims



1. A drain system for draining, from a settling chamber of a trapping device, foreign liquid which has separated from a supply liquid flowing through the device, the foreign liquid having a specific gravity greater than that of the supply liquid, the drain system comprising

a float in the form of an annulus in the lower part of the settling chamber and having a specific gravity higher than that of the supply liquid and lower than that of the foreign liquid for floating on foreign liquid in the chamber,

a column for guiding the float along a predetermined path in the chamber as the float floats on the foreign liquids, said annulus encircling said column and being rotatable about said column by movement of liquid in said chamber,

an indicator located in and movable with the annulus of the float,

a sensor mechanically isolated from the indicator, said sensor being arranged in said column for actuation by the indicator when the indicator moves to a predetermined region of the predetermined path,

an electrical signal circuit means responsively connected to said sensor for causing an actuating signal in response to detection of a predetermined quantity of foreign liquid in the settling chamber, and

means responsible to such an actuating signal for effecting drainage of foreign liquids from the chamber.

4,447,322

APPARATUS FOR THE CYCLONE SEPARATION OF LIQUIDS HAVING DIFFERENT DENSITIES

Miroslav Zajdlik, Bratislava, Czechoslovakia, assignor to Vyskummy ustav vodneho hospodarstva, Bratislava, Czechoslovakia

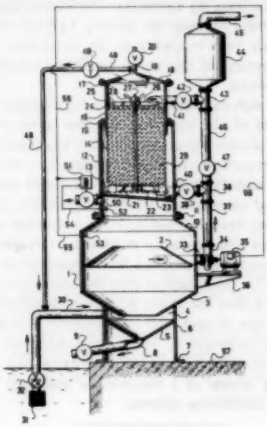
Filed May 9, 1983, Ser. No. 493,001

Claims priority, application Czechoslovakia, May 7, 1982, 3299-82

Int. Cl.³ B01D 21/24

U.S. Cl. 210—104 4 Claims

4. In an apparatus for the vortical separation of liquid having different densities with automatic delivery, said apparatus having a pump, a filter, a vortex separator, a cylindrical housing for the vortex separator, discharge piping tangentially attached to the housing and to the pump, the reservoir being closed in the lower part thereof with a conical bottom and with a vortex chamber provided with tangentially attached feed piping with a suction basket and a run-back closure, the improvement wherein a conical insertion piece is disposed in the cylindrical housing for the vortex separator coaxially thereof, the upper part of the cylindrical housing of the vortex separator is closed by an upwardly converging frusto-conical housing part above which there is attached the housing for a filter, the two housings being coaxial, the housing for the filter being closed at the bottom thereof by a slanting bottom and in the upper part thereof by an upper sealing joint, the upper housing part for the filter being closed by a upwardly converging cover coaxial thereof, delivery piping, changing-over branch piping, changing-over closure and inlet piping being tangentially attached to the lower part of the housing for the filter and being connected to the pump and to the upper housing for the filter, discharge piping tangentially attached to the upper part of the



housing for the filter and connected through a discharge valve through and through discharge branch piping to a storage reservoir, discharge piping for said reservoir, a discharge coupling being connected to the housing for the filter beneath the slanting bottom of the housing, such coupling being ended by an electromagnetic valve which is connected by an electric circuit with an upper fluid level detector and by a further interconnecting circuit with a lower liquid level detector, the electromagnetic valve being further connected with the electric motor for the pump by a still further electric circuit.

4,447,323

TRASH RAKE WITH RECOVERY GUTTER

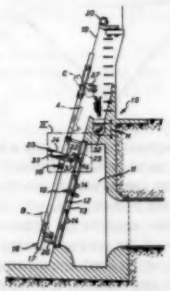
Philip Jackson, Paris, France, assignor to E. Beaudrey & Cie, Paris, France

Filed Dec. 10, 1981, Ser. No. 329,601

Claims priority, application France, Dec. 11, 1980, 80 26266

Int. Cl.³ B01D 35/08

U.S. Cl. 210—158 8 Claims



1. A trash rake for cleaning a bar screen of a water intake,

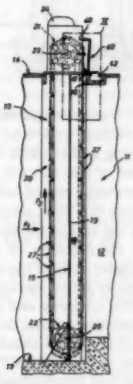
said trash rake comprising a carriage mounted for movement along a track arranged parallel to and upstream of the bar screen, said carriage carrying a pan extending transversely to said track, said pan having a rake member along its transverse edge proximate to the bar screen, said rake member having teeth shaped and arranged to be received between adjacent bars of the bar screen for removing foreign bodies therefrom during displacement of said carriage in at least one direction, a recovery member associated and in continuity with said rake member for collecting foreign bodies removed by said rake member, the improvement wherein said recovery member defines a watertight gutter means for maintaining collected foreign bodies, including living creatures, in water during displacement in said one direction even when said recovery member is emersed, said pan member is mounted on a pivot disposed generally parallel to said bar screen with said recovery member being immediately adjacent said rake member for positioning between said pivot and said bar screen.

4,447,324

WATER SCREEN WITH REVOLVING SCREEN MEMBER

Philip Jackson, 15 Rue Las Cases, 75007 Paris, France

Filed Apr. 8, 1982, Ser. No. 366,700
Claims priority, application France, Apr. 9, 1981, 81 07137
Int. Cl.³ B01D *33/02*
U.S. Cl. 210—159 **7 Claims**



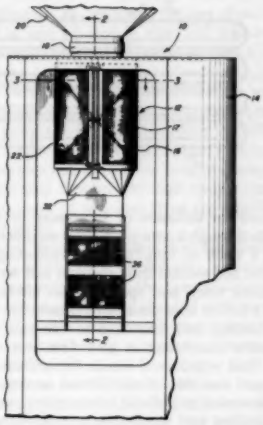
1. A water screen comprising a revolving screen member and a washing device disposed adjacent the downstream run or face of said screen member, said washing device comprising a spray means disposed on one side of said downstream run or face of said screen member to direct a jet of fluid towards said screen member to detach material deposited thereon, a recovery device disposed on the opposite side of said downstream run or face of said screen member to recover the material detached therefrom, a mobile trough member on said opposite side of said downstream run or face of said screen member between said recovery device and said sprayer, said trough member having a leading edge adjacent said downstream run or face of said screen member and a trailing edge adjacent said recovery device, said trough member extending transversely and obliquely from said leading edge to said trailing edge, and pivot means for maintaining said leading edge of said trough member continuously in contact with said screen member, for preventing the material from falling between said screen member and said recovery device.

4,447,325

VERTICAL PRE-DEWATERING SCREEN

General J. Pauley, Roanoke, Va., assignor to Gala Industries, Inc., Eagle Rock, Va.

Continuation of Ser. No. 229,054, Jan. 27, 1981, abandoned. This application Nov. 29, 1982, Ser. No. 444,875
Int. Cl.³ B01D *25/30, 23/20, 39/12*
U.S. Cl. 210—295 **5 Claims**



1. In combination with a device for separating solids from liquid in a slurry including a vertically disposed, elongated annular screen having a gravity slurry feed inlet and hopper communicating with the upper end thereof, an inclined screen having a portion underlying the lower end of said annular screen to receive solids and liquid after a substantial quantity of liquid has been removed by passing laterally through the annular screen with the inclined screen enabling passage of additional liquid downwardly therethrough while conveying solids laterally to further dewater the solids, that improvement comprising a baffle disposed in said annular screen, said baffle comprising a pair of imperforate baffle members supported centrally of said annular screen with each baffle having a straight inner edge and an outer edge conforming with the interior of the annular screen and a planar top surface, said outer edges being spaced from the inner surface of the annular screen, said straight inner edges of the baffle members extending generally diagonally of the annular screen and intersecting with each other adjacent the center of the annular screen thereby providing a pair of upwardly facing oppositely inclined flat surfaces on which the downwardly flowing slurry impinges with generally equal portions of the slurry flow stream being deflected toward opposite peripheral portions of the annular screen for passage of liquid therethrough and downward flow of solids between the inner surface of the annular screen and the lower edge portions of the baffle members onto the inclined screen.

4,447,326
DEVICE FOR THE DIFFUSION OF SUBSTANCES BETWEEN TWO FLUIDS VIA SEMIPERMEABLE MEMBRANES

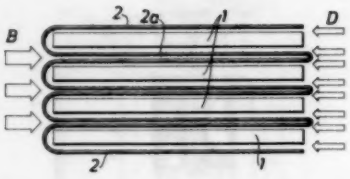
Gerhard Riede, Vellinge, and Kjell H. I. Christopherson, Staffanstorp, both of Sweden, assignors to Gambro AG, Switzerland

PCT No. PCT/SE80/00082, 371 Date Mar. 17, 1981, 102(e) Date Mar. 17, 1981, PCT Pub. No. WO81/02681, PCT Pub. Date Oct. 1, 1981

PCT Filed Mar. 19, 1980, Ser. No. 245,649

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—321.3 **32 Claims**



1. A device for diffusion of substances between first and second fluids through a semi-permeable membrane, said device comprising a stack of longitudinally extending spacer plates including first and second ends and first and second longitudinally extending sides, said spacer plates alternating between the folds of a folded semi-permeable membrane, first fluid feed means for feeding said first fluid to one side of said folded semi-permeable membrane at said first end of said spacer plates, first fluid withdrawal means for withdrawing said first fluid from said one side of said folded semi-permeable membrane at said second end of said spacer plates, second fluid feed means for feeding said second fluid to the other side of said folded semi-permeable membrane, second fluid withdrawal means for withdrawing said second fluid from said other side of said folded semi-permeable membrane, channel means extending longitudinally across the faces of said spacer plates, said spacer plates including transverse duct means extending transversely across substantially the entire width of said faces of said spacer plates, said transverse duct means being in fluid communication with both said first and second longitudinally extending sides of said spacer plates and being substantially continuous across the length thereof whereby no direct fluid communication is provided between said traverse duct means and the opposite side of said spacer plates through said spacer plates, and fluid connecting means extending between said transverse duct means and said channel means for providing fluid communication therebetween.

4,447,327
PRESSURE FILTERS

Norman O. Clark, Par, England, assignor to English Clays Lovering Pochin & Co. Ltd., Cornwall, England

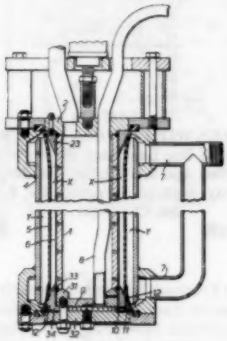
Division of Ser. No. 87,208, Oct. 22, 1979, which is a continuation-in-part of Ser. No. 856,493, Dec. 1, 1977. This application Oct. 22, 1979, Ser. No. 290,240

Claims priority, application United Kingdom, Dec. 1, 1976, 50191/76

Int. Cl.³ B01D *29/02*

U.S. Cl. 210—350 **7 Claims**

1. In a tube pressure filter of the kind set forth comprising (a) a pair of generally coaxial inner and outer tubular bodies arranged one within the other and adapted to be supported in a generally upright position, (b) an impermeable elastic sleeve disposed within and secured to the outer tubula body, (c) a filter element disposed around and supported by the inner tubular body, (d) first outlet means whereby filtrate which has passed through the filter element can be discharged from the tube pressure filter, and (e) second outlet means whereby solid retained on said filter element can be discharged from the tube pressure filter, wherein the inner tubular body comprises a cylindrical central section, around which central section there is disposed the filter element, and upper and lower end sections secured one to each end of said central cylindrical section, each of which end sections includes an enlarged portion of greater diameter than said cylindrical central section, and wherein the arrangement is such that in a first operating condition of the tube pressure filter said second outlet means is closed and the tubular bodies co-operate with each other to define a closed annular chamber which is divided into generally coaxial and non-intercommunicating inner and outer compartments by said impermeable elastic sleeve, the inner compartment having an inlet for feed material (comprising a mixture of a liquid and a particulate solid) and the outer compartment having an inlet for a hydraulic fluid under pressure, and in a second operating condition of the tube pressure filter, the second outlet means is open to enable the particulate solid to be



discharged from the inner compartment; the improvement which comprises providing said tube pressure filter with a filter element comprising a filter cloth sleeve which is tailored from a woven material so that the warp and/or the weft filaments of said woven material extend helically around the inner tubular body on which the filter element is supported, said filter cloth sleeve having an unstretched diameter which is at least 5% larger than the diameter of the cylindrical central section of the inner tubular body of the tube pressure filter, and being stretchable laterally by an amount in the range of from about 8% to about 20%, whereby said sleeve can be stretched tansversely of the length thereof and drawn over said portions of the end sections of the inner tubular body which are of greater diameter than said cylindrical central section, and thereafter can be stretched longitudinally along the length of said central section thereby enabling emplacement or replacement of said sleeve without the need for removing a said end section.

4,447,328
FILLER FOR LIQUID CHROMATOGRAPHY AND METHOD FOR SEPARATING WATER-SOLUBLE SUBSTANCES USING SAID FILLER

Fumio Kamiyama, Kyoto; Kazutoshi Yamazaki, Ohtsu; Minoru Kohara, Kyoto, and Mituo Nagata, Shiga, all of Japan, assignors to Sekisu Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 160,741, Jun. 18, 1980, abandoned. This application Feb. 16, 1982, Ser. No. 349,252

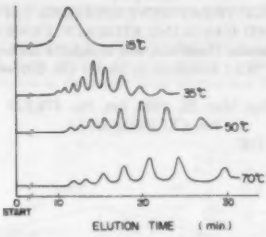
Claims priority, application Japan, Jun. 22, 1979, 54-79494; Aug. 6, 1979, 54-100363

Int. Cl.³ B01D *15/08*

U.S. Cl. 210—635 **5 Claims**

1. A method for separating water-soluble substances, which comprises subjecting said water-soluble substances to reversed phase liquid chromatography using an aqueous medium as an

eluent and a filler comprising a particulate synthetic polymer, said polymer being a single polymer of (a) a monomer selected from the group consisting of tetramethylolmethane di-, tri- or



tetra-(meth)acrylate, trimethylolpropane tri-(meth)acrylate, trimethylolethane tri-(meth) acrylate, dipentaerythritol di- to hexa-(meth)acrylate, glycerol di- or tri-(meth)acrylate, polyethylene glycol di-(meth)acrylate of the formula

$$CH_2=\underset{\substack{|\\R_1}}{C}-\underset{\substack{||\\O}}{C}+OCH_2CH_2\rightarrow_n O-\underset{\substack{||\\O}}{C}-\underset{\substack{|\\R_1}}{C}=CH_2$$

wherein R_1 is H or CH_3, and $3 \geqq n \geqq 1$, polypropylene glycol di-(meth)acrylate of the formula

$$CH_2=\underset{\substack{|\\R_1}}{C}-\underset{\substack{||\\O}}{C}-O+\underset{\substack{|\\CH_3}}{CH}-CH_2-O\rightarrow_n \underset{\substack{||\\O}}{C}-\underset{\substack{|\\R_1}}{C}=CH_2$$

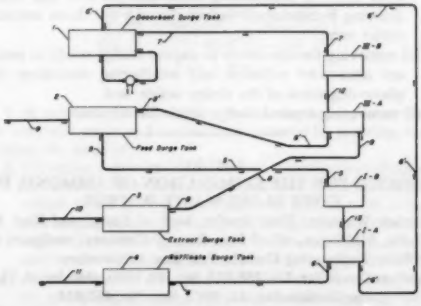
wherein R_1 is H or CH_3, and n is an integer of 1–24, and neopentyl glycol di(meth)acrylate, or (b) a combination of two or more of said monomers, said filler exhibiting a behavior such that in liquid chromatography using polyethylene glycol as a sample and water as an eluent, the elution time of the sample increases with a rise in temperature.

4,447,329

CONTINUOUS DESALINATION PROCESS

Donald B. Broughton, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jun. 13, 1983, Ser. No. 503,490
Int. Cl.³ B01D *15/04*
U.S. Cl. 210—673 **6 Claims**



1. A stepwise cyclical process for the desalination of an aqueous solution of a dissolved salt by employment of an adsorbent comprising a thermally regenerable ion retarding resin which has a retention capacity for the ions of said salt inversely proportional to temperature, which process comprises the following operations:

(a) maintaining fluid flow through at least two columns of said adsorbent, at least one column comprising an adsorption zone, and at least one column comprising a desorption zone;

(b) maintaining said adsorption zone defined by the adsorbent located between a feed input stream at an upstream boundary of said zone and a raffinate output stream at a downstream boundary of said zone;

(c) maintaining said desorption zone immediately upstream, with respect to said single direction, of said adsorption zone, said desorption zone defined by the adsorbent located between a desorbent input stream at an upstream boundary of said zone and said extract output stream at a downstream boundary of said zone;

(d) passing said feed mixture into said adsorption zone at adsorption conditions comprising a relatively low temperature to effect the adsorption of the ions of said salt by said adsorbent in said adsorption zone and withdrawing as a raffinate output stream the entire effluent from said adsorption zone comprising water of reduced salt content, a sufficient portion of said raffinate output stream being withdrawn and stored during a first stage of each step for use as the desorbent stream throughout the following step;

(e) passing a desorbent material comprising water of reduced salt content into said desorption zone at desorption conditions comprising a relatively high temperature to effect the displacement of said ions from the adsorbent in said desorption zone;

(f) withdrawing the entire effluent from said desorption zone sequentially in the course of each step, a quantity of liquid during a first stage having the composition of said feed mixture, such quantity being blended with the feedstream, and, during a second stage, an extract output stream comprising a solution having a higher concentration of salt than said feed mixture; and

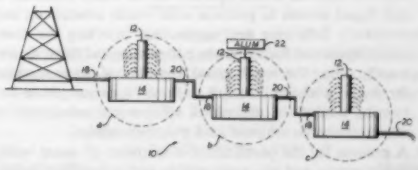
(g) periodically at the completion of each step advancing through said columns of adsorbent in a downstream direction with respect to fluid flow the feed input stream, raffinate output stream, desorbent input stream, and extract output stream, to effect the shifting of zones through said adsorbent and the initiation of the next step, each cycle being completed upon completion of the number of steps required for a given portion of said adsorbent to make a complete circuit through said zones.

4,447,330

METHOD OF TREATING WASTE WATER

David Babineaux, III, P.O. Box 103, Rayne, La. 70578

Continuation of Ser. No. 280,059, Jun. 30, 1981, abandoned, which is a continuation of Ser. No. 94,755, Nov. 15, 1979, abandoned, which is a continuation of Ser. No. 15,416, Feb. 26, 1979, abandoned. This application Mar. 23, 1983, Ser. No. 476,400
Int. Cl.³ C02F *1/52, 1/74*
U.S. Cl. 210—717 **1 Claim**



1. A method of purifying and treating waste water used in drilling oil and gas wells, said waste water containing impurities comprising chlorides, suspended solids, dissolved solids, and oil or grease consisting essentially of the steps of providing a plurality of serially connected sedimentation tanks with each tank having an aerator feed pipe, at least one spray aerator positioned in and above the tank, and a tank discharge pipe,

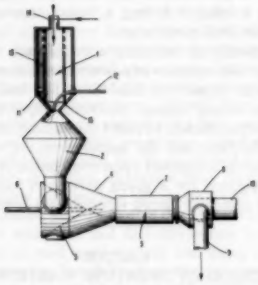
introducing waste water into an initial aerator feed pipe of one of said sedimentation tanks, spraying said waste water from each aerator feed pipe with the aerator into the atmosphere and back into the tank in order to aerate the waste water and permit the aerated waste water to recollect in the tank, skimming clear waste water from the top of each sedimentation tank into said tank discharge pipe and feeding said clear waste water into the aerator feed pipe of a subsequent one of said serially connected sedimentation tanks introducing an effective amount of a flocculent into the waste water ahead of the aerator in at least one of said sedimentation tanks so that said flocculent is mixed, aerated, and agitated along with the waste water, said flocculent reacting with minerals contained in said waste water to form a flocculent precipitate which aids in coagulating said impurities, settling said impurities as the waste water passes sequentially from one sedimentation tank to another of said tanks, and discharging clean water directly from one of said sedimentation tanks for disposal or reuse.

4,447,331

INTIMATE CONTACTING/SEPARATING OF PLURAL PHASES

Francois Prudhon, Versailles, and Augustin Scicluna, Aubervilliers, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Sep. 23, 1981, Ser. No. 304,938
Claims priority, application France, Sep. 24, 1980, 80 20464
Int. Cl.³ C02F *1/58*
U.S. Cl. 210—721 **12 Claims**



1. A process for the purification of a liquid stream containing waste materials while inhibiting the formation of deposits on the wall of a treatment vessel, comprising the steps of:

establishing a vertically descending current of axially extending, axially symmetrical helical flow of a gaseous phase in said treatment vessel;

contacting said liquid stream with a second fluid stream of a reactive material which operates on the waste materials in said liquid stream to produce solid waste substances; and

immediately following said contacting, injecting the combined liquid and fluid streams into said helical flow, downwardly along the longitudinal axis thereof, to co-atomize the liquid and fluid stream with the gaseous phase and thereby inhibit the deposit of solid waste substances or reactants on the walls of said treatment vessel.

9. A process for the purification of a stream of waste water containing orgnic and inorganic sulfide and polysulfide pollutants, comprising the steps of:

establishing a vertically descending current of axially extending, axially symmetrical helical flow of a gaseous phase;

contacting said waste water stream with a stream comprising a solution of hydrochloric acid, and thence

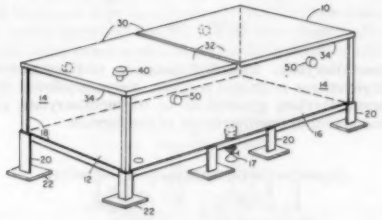
immediately injecting said liquids for co-atomization/reaction into said helical flow of gaseous phase, downwardly along the longitudinal axis thereof.

4,447,332

FUEL SLUDGE TREATMENT METHOD, ESPECIALLY FOR LEADED GASOLINE STORAGE TANK SLUDGE

Robert W. Crisman, Hamilton, and Dominick DeAngelis, Trenton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 25, 1983, Ser. No. 478,823
Int. Cl.³ B01D *35/14*
U.S. Cl. 210—748 **5 Claims**



5. A method of treating sludge from liquid petroleum product storage sites comprising the sequential steps of

(a) transporting a solid-liquid sludge mixture containing volatile liquid hydrocarbons, sludge solids and water to an enclosed outdoor filter tank having a sloped bottom portion and a removable top closure, a lower coarse inert particle bed covering the sloped bottom portion, a liquid drain for receiving liquid through the coarse particle bed, an upper fine inert particle bed extending horizontally over the lower coarse particle bed, a porous screen separator disposed between said upper and lower beds for supporting said finer particle bed; and a flame arrestor vent mounted above the upper bed for permitting controlled venting of volatile materials from the enclosed tank under hydrocarbon conservation conditions;

(b) applying the sludge mixture uniformly over the filter particles;

(c) draining liquid from the sludge mixture through the filter particles to deposit a layer of wet sludge solids onto the filter particles;

(d) permitting residual sludge liquids to evaporate in the filter tank by introducing controlled airflow and withdrawing hydrocarbon vapors through the flame arrestor outlet vent;

(e) removing the top cover to expose sludge solids to ambient ultraviolet radiation and weathering conditions for photo-degration of the sludge solids; and

(f) recovering treated sludge solids for disposal.

4,447,333

PROCESS FOR THE ELIMINATION OF AMMONIA IN COKE PLANT WASTE WATERS

Dietrich Wagener; Theo Sander, both of Essen, and Karl H. Laue, Hattingen, all of Fed. Rep. of Germany, assignors to Didier Engineering GmbH., Fed. Rep. of Germany

Continuation of Ser. No. 188,827, Sep. 19, 1980, abandoned. This application Jan. 12, 1983, Ser. No. 457,444
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1979, 2938654
Int. Cl.³ C02F *1/20, 1/70, 1/72*
U.S. Cl. 210—750 **5 Claims**

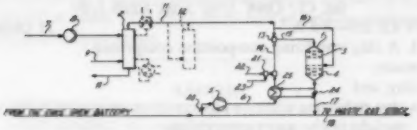
1. A process for concurrently treating an ammonia-containing waste fluid stream and a NO_x-containing flue gas from a coking plant comprising:

separating the waste fluid stream into a major portion and a minor portion;

combining the major portion of the waste fluid stream with the flue gas to form a mixture containing at least a stoichiometric ration of NO_x to ammonia;

introducing the mixture into a reactor in the form of a spray or vapor;

reacting the mixture in a first catalyst bed at a temperature of at least about 250° C. for converting a substantial amount of ammonia in the waste fluid stream and NO_x in the flue



gas into a nitrogen and water vapor reaction product, the reaction being exothermic;

heating the minor portion of the waste fluid stream in the reactor with the heat generated from the reaction of the mixture in the first catalyst bed; and

reacting in a second catalyst bed the minor portion of the waste fluid stream with the reaction product of the first catalyst bed for converting a further amount of ammonia in the waste fluid stream and NO_x in the flue gas into a nitrogen and water vapor waste gas, and removing said waste gas from said reactor.

4,447,334

METHOD FOR THE DEWATERING OF LUMP PEAT

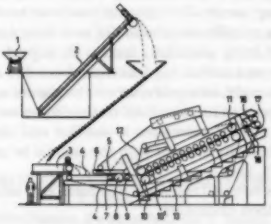
Hugo Britschgi, Stalden, and Burkard Rosenberg, Horw, both of Switzerland, assignors to Bell Maschinenfabrik Aktiengesellschaft, Kriens, Switzerland

Filed Mar. 18, 1982, Ser. No. 359,584

Claims priority, application Switzerland, Apr. 28, 1981, 2750/81

Int. Cl.³ B30B *9/24*

U.S. Cl. 210—783 **8 Claims**



1. A method of continuously dewatering lump peat or similar naturally moist and coarse lump material by pressing, comprising the steps of:

a. providing a dewatering apparatus including a preliminary dewatering zone comprising upper and lower screen belts which travel a loop on at least one pair of rolls, a main dewatering zone comprising upper and lower screen belts which travel through the nips of successive pairs of rolls, and an elastic watertight pressure belt interposed between each screen belt and the rolls and having the same width as, and being designed to receive and carry away water expressed through, the associated screen belt, and a high pressure zone comprising upper and lower screen belts which travel through the nip or at least one pair of rolls;

b. fracturing the material to be dewatered into particles of approximately 2–3 cm diameter;

c. dispersing said particles breadthwise onto the lower screen belt of the preliminary dewatering zone and carrying the strewn material through this zone between the two belts thereof so that it is pressed only through the tension of the belts;

d. carrying the material leaving the preliminary dewatering zone through the main dewatering zone between the belts thereof and subjecting it to successively increasing pressure in the nips of the rolls of the zone, whereby water is pressed from the material and transferred into the pressure belts; and

e. carrying the material leaving the main dewatering zone through the high pressure zone between the screen belts thereof and subjecting it to a higher pressure in the nip or nips of this zone than that exerted by the last pair of rolls of the main dewatering zone.

4,447,335

PROCESS FOR THE PREPARATION OF THIN FILMS OF CADMIUM SULFIDE AND PRECURSOR SOLUTIONS OF CADMIUM AMMONIA THIOCYANATE COMPLEX USEFUL THEREIN

Otto E. Loeffler, Woodbridge, N.J.; Nirmal S. Jain, Irvington, and Otto S. Kauder, New York, both of N.Y., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Division of Ser. No. 249,530, Mar. 31, 1981, Pat. No. 4,360,542. This application Mar. 22, 1982, Ser. No. 360,943

Int. Cl.³ C01C *3/20*

U.S. Cl. 252—1 **10 Claims**

1. An aqueous solution in ammonium hydroxide comprising a cadmium ammonia thiocyanate complex decomposable when heated at a temperature above 65° C. to form a cadmium sulfide insoluble in the solution, having a pH within the range from about 8 to about 10, and a ratio NH_3:SCN within the range from about 0.5:1 to about 2:1.

4,447,336

STABILIZED GALACTOMANNAN GUM COMPOSITIONS

Howard L. Vandersall, Upland, Calif., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 18, 1981, Ser. No. 332,287

Int. Cl.³ A62D *1/00*

U.S. Cl. 252—7 **21 Claims**

1. An aqueous fire retardant composition comprising an ammonium phosphate fire retardant selected from the group consisting of monoammonium orthophosphate; diammonium orthophosphate; monoammonium pyrophosphate; diammonium pyrophosphate; triammonium pyrophosphate; tetraammonium pyrophosphate; ammonium, polyphosphates; ammonium-alkali metal mixed salts of ortho-, pyro-, and polyphosphates; ammonium-alkaline earth metal mixed salts of ortho-, pyro-, and polyphosphates; and mixtures thereof, a viscosity increasing amount of galactomannan gum thickener, and, in an amount effective to reduce viscosity loss of the composition during storage, a water-soluble molybdenum compound.

4,447,337

STABIIZED GALACTOMANNAN GUM COMPOSITIONS

Mohammad S. Adl, West Covina; Gary H. Kegeler, Alta Loma, and Howard L. Vandersall, Upland, all of Calif., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 24, 1982, Ser. No. 351,710

Int. Cl.³ A62D *1/00*

U.S. Cl. 252—7 **28 Claims**

1. An aqueous fire retardant composition comprising ammonium phosphate fire retardant selected from the group consisting of monoammonium orthophosphate; diammonium orthophosphate; monoammonium pyrophosphate; diammonium pyrophosphate; triammonium pyrophosphate; tetraammonium pyrophosphate; ammonium polyphosphates; ammonium-alkali metal mixed salts of ortho-, pyro-, and polyphosphates; am-

monium-alkaline earth, metal mixed salts of ortho-, pyro-, and polyphosphates; and mixtures thereof, a viscosity increasing amount of a galactomannan gum thickener, and, in an amount effective to reduce viscosity loss of the composition during storage, a stabilizer system comprising a mixture of water-soluble molybdenum compound and a thiourea of the formula

in which each R independently is hydrogen, alkyl of 1-3 carbon atoms, or one R of each nitrogen atom are joined to form an alkylene radical of 2-4 carbon atoms.

4,447,338

DRILLING MUD VISCOSIFICATION AGENTS BASED ON SULFONATED IONOMERS

Robert D. Lundberg, Bridgewater, N.J.; Thad O. Walker, Humble; Charles P. O'Farrell, Houston, both of Tex., and Henry S. Makowski, deceased, late of Scotch Plains, N.J. (by Patricia H. Makowski, executrix), assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Aug. 12, 1981, Ser. No. 292,235
Int. Cl.³ C09K 7/06
U.S. Cl. 252—8.5 M **10 Claims**

1. An oil base drilling mud which comprises:
(a) an organic liquid selected from the group consisting of a diesel fuel, kerosene, fuel oil and crude oil;
(b) about 1 to about 10 parts by weight of water per 100 parts by weight of the organic liquid;
(c) about 20 to about 50 lb/bbl of at least one emulsifier;
(d) weighting material of sufficient quantity necessary to achieve the desired density; and
(e) about 0.25 to abut 2 lb/bbl of a water insoluble neutralized sulfonated elastomer, said neutralized sulfonated polymer elastomer having about 5 to about 30 meg. of sulfonate groups per 100 grams of the neutralized sulfonated polymer elastomer, said neutralized sulfonated elastomer being derived from an elastomeric polymer selected from the group consisting of EPDM terpolymers and butyl rubber, said EPDM terpolymers having a number average molecular weight of about 10,000 to about 200,000 and said butyl rubber having a Staudinger molecular weight of about 20,000 to about 500,000.

4,447,339

OIL WELL DRILLING CLAY CONDITIONERS AND METHOD OF THEIR PREPARATION

William J. Detroit, Schofield, Wis., assignor to Reed Lignin, Inc., Greenwich, Conn.

Filed Jun. 26, 1981, Ser. No. 277,714
Int. Cl.³ C09K 7/02
U.S. Cl. 252—8.5 A **27 Claims**

1. An oil well drilling fluid additive comprising the oxidation product of a sulfonated lignin-containing material and manganese dioxide and having an equivalent manganese content of about 2 to about 15 percent.

4,447,340

METHOD OF TRACING A WELL DRILLING MUD

Jean-Jacques Féy, Bar le Duc, France, assignor to Compagnie Francaise des Petroles, Paris, France

Division of Ser. No. 222,843, Jan. 6, 1981, Pat. No. 4,352,674. This application Jun. 22, 1982, Ser. No. 391,041
Claims priority, application France, Jan. 8, 1980, 80 00263
Int. Cl.³ C09K 7/02
U.S. Cl. 252—8.5 C **4 Claims**

1. An aqueous clay containing drilling mud with tracing ions suitable for use in the tracing of a well drilling mud, wherein said ions comprise the acetate ion, CH_3COO^- present in the drilling mud in a concentration of from 1×10^{-3} to 5×10^{-2} ions per liter, wherein said acetate ion in said concentration does not affect the swelling properties of the clay.

4,447,341

CLAY STABILIZER COMPOSITION FOR AQUEOUS DRILLING FLUIDS

Jacob Block, Rockville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Aug. 27, 1982, Ser. No. 412,152
Int. Cl.³ C09K 7/00, 3/00; E21B 3/00
U.S. Cl. 252—8.5 A **31 Claims**

1. A clay stabilizing composition comprising
water,
clay, and
a clay stabilizing additive mixture in an amount of 1-5% by weight of the water comprising
an aluminum hydroxide having the formula AlO(OH), and
a crosslinked polyvinyl alcohol which is crosslinked with at least about 0.05 to 200 percent of stoichiometry with a compound containing at least one aldehyde group therein or capable of generating in an aqueous medium at least one aldehyde group.

4,447,342

METHOD OF CLAY STABILIZATION IN ENHANCED OIL RECOVERY

John K. Borchardt, and David L. Brown, both of Duncan, Okla., assignors to Halliburton Co., Duncan, Okla.

Filed Apr. 19, 1982, Ser. No. 369,764
Int. Cl.³ E21B 43/22, 43/12, 43/25
U.S. Cl. 252—8.55 D **26 Claims**

1. In an oil reservoir subject to enhanced oil recovery treatment, said treatment including the introduction of anionic or caustic flood chemicals into said reservoir, a method of stabilizing clays comprising the steps of:
mixing a clay stabilizing cationic organic polymer with a carrier fluid;
introducing the clay stabilizing cationic organic polymer containing carrier fluid into the reservoir treatment area,
introducing an effective amount of non-ionic aqueous fluid, said fluid being essentially inert with respect to said clay stabilizer and containing less than about 5% monovalent salts by weight, into said reservoir treatment area to cause said polymer to reorient itself on the clay in such a manner that said polymer continues to stabilize said clay, but does not substantially interact with the anionic or caustic flood chemicals, and
introducing into said reservoir treatment area said anionic or caustic flood chemicals.

4,447,343

CONCENTRATED FABRIC SOFTENERS

Adolf May, Hofheim am Taunus, and Hans-Walter Bücking, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 9, 1982, Ser. No. 448,296
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1981, 3150178
Int. Cl.³ D06M 13/30, 13/46
U.S. Cl. 252—8.75 **7 Claims**

1. Transparent, liquid fabric softener concentrates consisting substantially of
(a) from 26 to 40 weight % of a cationic softener,
(b) from 0.01 to 8 weight % of an anionic surfactant,
(c) from 0.01 to 8 weight % of a nonionic dispersant,
(d) from 3 to 30 weight % of a C_1-C_3 alcohol, and
(e) water in an amount remaining to complete to 100%.

4,447,344

DEWATERING AIDS FOR COAL AND OTHER MINERAL PARTICULATES

William J. Roe, Aurora, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Jun. 2, 1983, Ser. No. 500,497
Int. Cl.³ C09K 3/18; B01D 43/00; F26B 1/00, 5/08
U.S. Cl. 252—60 10 Claims

1. A composition for altering the water function characteristics of a wet, particulate mineral mass comprising: a surfactant material having a hydrophile-lipophile balance number of from about 6.0 to about 12.0; and a surfactant adsorption inhibitory amount of a hydrotrope.

4,447,345

THERMAL INSULATING FLEXIBLE CERAMIC CONTAINING FLAME HYDROLYSIS PRODUCED MICROPOROUS OXIDE AEROGEL

Hans Kummermehr, Ludwigshafen, and Rolf Sommer, Dannstadt-Schauernheim, both of Fed. Rep. of Germany, assignors to Grünzweig & Hartmann und Glasfaser AG, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 9, 1982, Ser. No. 356,504
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1981, 3108816
Int. Cl.³ C04B 43/02; E04B 1/78
U.S. Cl. 252—62 75 Claims

1. Thermal insulating flexible ceramic on the basis of microporous oxide aerogel obtained from flame hydrolysis with elastically bending or limply bending, fibers with or without additional additive substances characterized by the combination of the following features:

(a) the frequency distribution of the length of fibers has a maximum of over 10 mm;

(b) the flexible ceramic is compressed up to a bulk density of more than 200 kg/m^3;

(c) the sum of the portions of weight of the fibers and of the additive substances, which however contain no binder, lies between about 10% and 60% of the flexible ceramic; and

(d) the portion of weight of fibers with a specific density of the fiber material of 2.55 g/cm^3 insofar as the fibers have a greater length than 10 mm, lies between about 10% and 30% of the flexible ceramic, whereby in the case of fiber material with a density of 2.55 g/cm^3, the portions deviating from weight are to be changed with a factor which corresponds to the ratio of the deviating density to 2.55.

4,447,346

ELECTROLYTE SYSTEM FOR ELECTROLYTIC CAPACITORS

Richard W. MacNamee, Pickens; Morris T. Reese, Taylors, and Emil F. Blase, Pickens, all of S.C., assignors to Sangamo Weston, Inc., Springfield, Ill.

Continuation of Ser. No. 12,321, Feb. 15, 1979, abandoned, which is a continuation of Ser. No. 841,181, Oct. 11, 1977, abandoned. This application Feb. 18, 1983, Ser. No. 467,946
Int. Cl.³ H01G 9/02
U.S. Cl. 252—62.2 4 Claims

1. A substantially non-aqueous electrolyte composition for aluminum-anode electrolyte capacitors consisting essentially of ethylene glycol solvent and:

a reaction product formed at a temperature below about 35° C. in the presence of said ethylene glycol solvent when an amount of fumaric acid is reacted with twice the molar concentration of a base, said base being selected from the group consisting of ammonia, a primary amine of the formula RNH_2, a secondary amine of the formula RR'NH and a tertiary amine of the formula RR'R''N wherein R, R' and R'' are selected from a group consisting of C_1 to C_4 alkyl and alkylene groups, with said substantially non-aqueous electrolyte composition being free of unreacted fumaric acid, and

wherein the total molar concentration of said fumaric acid and said base used to form the reaction product is less than about 0.3 mole per mole of said ethylene glycol and said electrolyte composition having a pH of between about 4.9 to 7.2 to prevent corrosion of the aluminum-anode.

4,447,347

HEAT STORAGE SYSTEM

Louis Goldfarb, Lancaster, and Clyde M. Sweigart, Landisville, both of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Mar. 3, 1983, Ser. No. 471,752
Int. Cl.³ C09K 3/18
U.S. Cl. 252—70 5 Claims

1. A heat storage system comprising calcium chloride hexahydrate as the storage medium and a dolomite-calcium hydroxide nucleating agent.

4,447,348

CARBOXYLIC SOLUBILIZER/SURFACTANT COMBINATIONS AND AQUEOUS COMPOSITIONS CONTAINING SAME

John W. Forsberg, Mentor-on-the-Lake, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 238,394, Feb. 25, 1981, Pat. No. 4,368,133, which is a continuation-in-part of Ser. No. 26,384, Apr. 2, 1979, abandoned, which is a continuation-in-part of Ser. No. 948,460, Oct. 4, 1978, abandoned, which is a continuation-in-part of Ser. No. 946,294, Sep. 27, 1978, Pat. No. 4,329,249. This application Mar. 4, 1982, Ser. No. 352,693
The portion of the term of this patent subsequent to May 11, 1999, has been disclaimed.
Int. Cl.³ C10M 1/08, 1/06, 3/04
U.S. Cl. 252—75 88 Claims

1. A composition comprising a continuous aqueous phase, and dispersed in said aqueous phase the combination of (A) at least one nitrogen-containing, phosphorus-free carboxylic solubilizer made by the reaction of (A)(I) at least one polycarboxylic acid acylating agent having at least one hydrocarbon-based substituent of at least about 12 to about 500 carbon atoms with (A)(II) at least one (a) N-(hydroxyl-substituted hydrocarbyl) amine, (b) hydroxyl-substituted poly(hydrocarbyloxy) analog of said amine or (c) mixtures of (a) and (b); and (B) at least one surfactant.

4,447,349

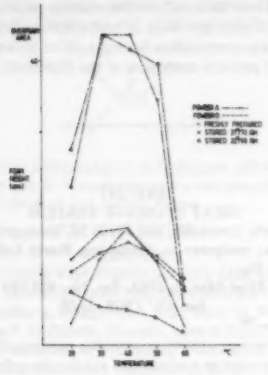
SUDS SUPPRESSING GRANULES FOR USE IN DETERGENT COMPOSITIONS

Louis H. T. Tai, Santes, France, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 259,284, Apr. 30, 1981, abandoned. This application Sep. 13, 1982, Ser. No. 417,817
Claims priority, application France, May 12, 1980, 80 10640
Int. Cl.³ C11D 17/00; B05D 7/00
U.S. Cl. 252—174.13 13 Claims

1. Suds-suppressing granules suitable for use in detergent compositions comprising from about 25% to 80% by weight of

a substantially spherical or cylindrical core material of sucrose and one or more coatings, at least one coating comprising from



about 5% to 30% based on the weight of the granules of a silicone oil mixture.

4,447,350

MIXTURES OF OPTICAL BRIGHTENERS AND THEIR USE

Thomas Martini, Bad Soden am Taunus; Erich Schinzel; Hans Frischkorn, both of Hofheim am Taunus; Herbert Friedrich, Heusenstamm, and Heinz Probst, Sulzbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

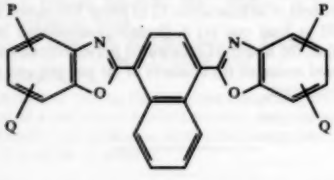
Continuation of Ser. No. 283,499, Jul. 15, 1981, abandoned. This application Sep. 15, 1983, Ser. No. 532,809

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1980, 3027479

Int. Cl.[3] **C11D** *7/26;* **D06L** *3/12*

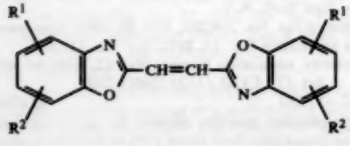
U.S. Cl. 252—301.22 **6 Claims**

1. Mixtures of optical brighteners consisting of 1 to 60% by weight of a compound of the formula (1)



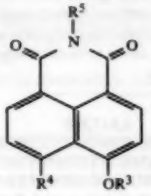
(1)

in which P and Q independently of one another denote alkyl, carbalkoxy, or alkylsulfonyl and 99 to 40% by weight of one or more compounds of the formulae (2) to (10)

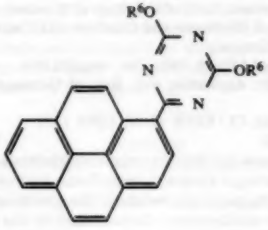


(2)

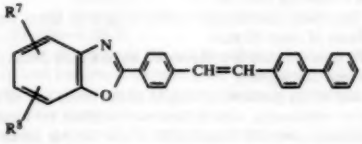
-continued



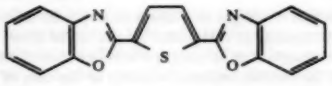
(3)



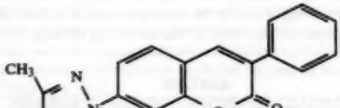
(4)



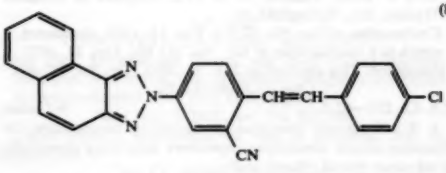
(5)



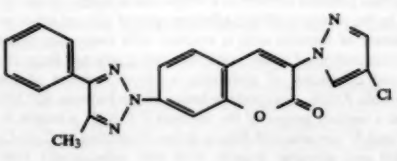
(6)



(7)

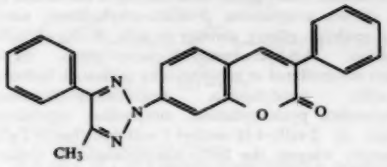


(8)



(9)

-continued



(10)

in which R^1 and R^2 independently of one another denote hydrogen or alkyl, R^3 denotes alkyl or alkoxyalkyl, R^4 denotes hydrogen or alkoxy, R^5 denotes alkyl, hydroxyalkyl, alkoxyalkyl or aralkyl, R^6 denotes alkyl and R^7 and R^8 denote hydrogen or alkyl, at temperatures of from 250° to 360° C.

4,447,351

PREPARATION OF ALUMINA HYDROSOL FROM ALUMINUM SULFATE SOLUTION

Tai-Hsiang Chao, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jan. 12, 1983, Ser. No. 457,547

Int. Cl.³ B01J *13/00*

U.S. Cl. 252—313 R **7 Claims**

1. Method of preparing an acidic, substantially sulfur-free alumina hydrosol from an aqueous aluminum sulfate solution which comprises the steps of:

a. admixing about a stoichiometric amount of M where M is selected from the group consisting of Ca, Sr, and Ba in the form of a mixture of $MCl_2.2H_2O$ and $M(OH)_2$ with said aqueous aluminum sulfate solution, said amount of M being sufficient to precipitate in excess of 98% of the sulfate radical of said solution;

b. filtering the resulting $M(SO_4)$ precipitate; recovering a substantially sulfur-free aluminum-containing filtrate solution; admixing sufficient aluminum metal with said filtrate solution to achieve a desired Al:Cl weight ratio in the so formed admixture; and

c. digesting said admixture at digestion conditions to form said alumina hydrosol.

4,447,352

HUMIDITY SENSITIVE ELEMENT

Haruhiko Inoue, Kariya; Shun-ichi Murasaki, Nagoya, and Masataka Naito, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 8, 1983, Ser. No. 464,861

Claims priority, application Japan, Feb. 17, 1982, 57-24239

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—519 **5 Claims**

1. A sintered, humidity sensitive element containing 70 to 20 mole % of $ZnFe_2O_4$ and 30 to 80 mole % of a member selected from the group consisting of SiO_2 and MnO_2.

4,447,353

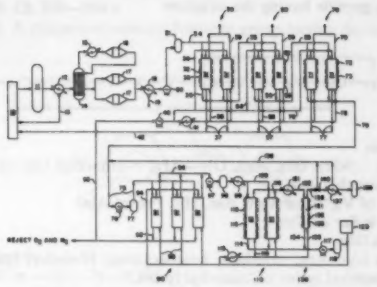
METHOD FOR TREATING A NUCLEAR PROCESS OFF-GAS STREAM

Dallas T. Pence, and Chun-Chao Chou, both of San Diego, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 63,970, Aug. 6, 1979. This application Sep. 11, 1980, Ser. No. 186,303

Int. Cl.³ B01J *20/18*; B01D *53/04*

U.S. Cl. 252—630 **4 Claims**



1. A method for selectively removing xenon in gas phase from a nuclear process off-gas stream which contains at least one other gas selected from the group consisting of krypton, oxygen, and nitrogen, said method comprising the step of directing said stream through an adsorbent bed containing silver-exchanged synthetic mordenite zeolite while maintaining said stream at about ambient temperature and pressure.

4,447,354

METHOD FOR MAKING OXIDATION-STABLE, LIGHT-COLORED GLYCEROL ESTER OF MODIFIED ROSIN

Roland P. F. Scharrer, Pelham, N.Y.; Robert W. Schluenz, Panama City, Fla., and Richard H. Kramss, Stamford, Conn., assignors to Arizona Chemical Company, Fair Lawn, N.J.

Filed Mar. 21, 1983, Ser. No. 477,114

Int. Cl.³ C09F *1/00, 1/04*

U.S. Cl. 260—106 **3 Claims**

1. A method of making a glycerol ester of modified rosin, wherein unmodified rosin is simultaneously disproportionated and esterified in presence of a disproportionating agent and glycerol and an esterification catalyst at a temperature sufficient for both reactions and for a time sufficient to reduce the abietic acid content to about 5% or less and to essentially complete the esterification.

4,447,355

METHOD FOR STABILIZING A TUMOR NECROSIS FACTOR AND A STABLE AQUEOUS SOLUTION OR POWDER CONTAINING THE SAME

Hajimu Sakamoto; Takao Kiyota, and Hiroshi Hayashi, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha and Dainippon Pharmaceutical Co., Ltd., both of Osaka, Japan

Filed Mar. 23, 1983, Ser. No. 477,866

Claims priority, application Japan, Apr. 7, 1982, 57-56690; Jul. 27, 1982, 57-129560

Int. Cl.³ C07G *7/00*

U.S. Cl. 260—112 B **47 Claims**

1. A method for stabilizing Tumor Necrosis Factor, which comprises adding to an aqueous solution or powder containing Tumor Necrosis Factor an effective amount of at least one stabilizing agent selected from the group consisting of an albumin, a gelatin, a globulin, a protamine and a salt of protamine.

4,447,356
CONOTOXINS

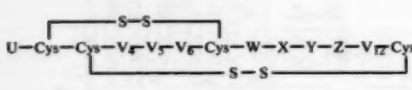
Baldomero M. Olivera, 1370 Bryan Ave., Salt Lake City, Utah 84105; Lourdes J. Cruz, 3993 Dangal, Sta Mesa, Manila, Philippines; William R. Gray, 3769 Parkview Dr., Salt Lake City, Utah 84117, and Jean E. F. Rivier, 9674 Blackgold Rd., La Jolla, Calif. 92037

Continuation-in-part of Ser. No. 255,237, Apr. 17, 1981, abandoned. This application Jun. 4, 1982, Ser. No. 385,125

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **15 Claims**

1. A peptide having the structure



wherein

U is —NH_2, Glu, Asp, Gly—Arg, N-trimethyl Glu or N-trimethyl Asp,

any of V_4, V_5 or V_6 is Asn, His, Pro or Ala,

V_{12} is Ser or Cys,

W is Gly,

X is Lys, Arg, ornithine, homoarginine, N-methyl lysine, dimethyl lysine or trimethyl lysine,

Y is Asn, Phe, Tyr, nitrotyrosine, His, Trp, monoiodo His, or substituted Phe,

Z is Leu, Val, Ile, Phe, Tyr, monoido Tyr, diiodo Tyr, monochloro-monoiodo Tyr, or cyclohexylalanine, and

R is —NH_2, —Gly—Lys—NH_2.

4,447,357
FIBRE-REACTIVE AZO DYESTUFFS CONTAINING A HALOTRIAZINYL RADICAL AND A NON-REACTIVE TRIAZINYL RADICAL

Gerd Hölzle, Liestal, and Rainer Begrich, Rheinfelden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

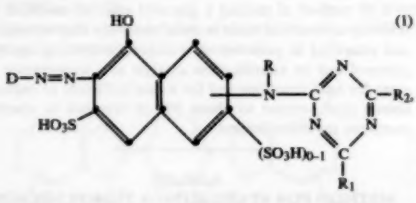
Filed Mar. 16, 1981, Ser. No. 243,233

Claims priority, application Switzerland, Mar. 18, 1980, 2125/80

Int. Cl.³ C09B *62/085, 62/09, 62/095, 62/08*

U.S. Cl. 260—153 **9 Claims**

1. An azo dye of the formula



(I)

wherein D is benzene, naphthalene, benzoylaminobenzene, azobenzene or stilbene, which is unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, phenoxy, alkanoylamino of 1 to 6 carbon atoms, benzoylamino, amino, alkylamino of 1 to 4 carbon atoms, phenylamino, alkoxycarbonyl of 1 to 5 carbon atoms, alkylcarbonyl of 1 to 5 carbon atoms, nitro, cyano, acetyl, carbamoyl, ureido, hydroxy, carboxy, halogen or sulfo, and which contains dihalo-s-triazinylamino or monohalo-s-triazinylamino substituted by methyl, ethyl, phenyl, C_{1-4}-alkylthio unsubstituted or substituted by carboxy; phenylthio, naphthylthio, hydroxy, C_1–C_6-alkoxy unsubstituted or substituted by carboxy; C_{1-6}-alkoxyalkoxy, C_{1-6}-alkoxyalkoxyalkoxy, cyclohexyloxy, phenoxy unsubstituted or substituted by chloro, nitro, carboxy or sulfo; naphthoxy unsubstituted or substituted by sulfo; —NH_2, C_{1-6}-mono- or -dialkyl-amino unsubstituted or substituted by C_{1-2}-alkoxy, chloro, hydroxy, carboxy, sulfo, sulfato or phenyl; cyclohexylamino, phenylamino unsubstituted or substituted by methyl, chloro, acetylamino, β-sulfato-ethylsulfonyl, nitro, hydroxy, methoxy, ethoxy, carboxy or sulfo; N-C_{1-2}-alkyl-N-phenylamino, N-β-hydroxyethyl-N-phenyl-amino, naphthylamino unsubstituted or substituted by sulfamoyl, hydroxy or sulfo; pyridylamino, benzthiazolyl-(2)-amino, quinolinylamino, pyrimidylamino, morpholino, piperidino, piperazino or 2-sulfo-4-(6′-methyl-7′-sulfobenzthiazol-2-yl)-phenylamino; wherein the halo-s-triazinylamino is bonded directly or via methylene to a ring carbon of D, and the amino bridging member by which the halo-s-triazinyl is bonded to a carbon atom in D is unsubstituted or substituted at the nitrogen atom by C_{1-4}-alkyl or -sulfoalkyl, R is hydrogen or alkyl of 1 to 4 carbon atoms, and R_1 and R_2, independently of one another, have the same meaning as those substituents referred to above of the monohalo-s-triazinyl in D; or a heavy metal complex thereof.

4,447,358
MONOAZO COMPOUNDS

Hansrudolf Schwander, Riehen, and Peter Furrer, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

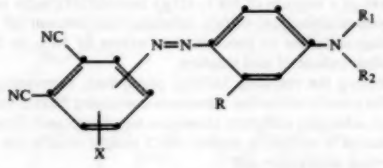
Filed Oct. 5, 1981, Ser. No. 308,691

Claims priority, application Switzerland, Oct. 16, 1980, 7737/80

Int. Cl.³ C09B *29/08, 29/26*

U.S. Cl. 260—205 **12 Claims**

1. A monoazo compound of the formula I



(I)

wherein X is hydrogen or halogen, R is hydrogen or C_1–C_4 alkyl, R_1 is C_1–C_8 alkyl, cycloalkyl or

wherein the phenyl radical can be monosulfonated, and R_2 is C_1–C_4 alkyl which is unsubstituted or substituted by a sulfo group or is cycloalkyl, with the proviso that either R_1 or R_2 contains a sulfo group.

4,447,359
SUBSTITUTED 2-(CHLORO, BROMO OR CYANO)-4,6-DINITROPHENYL AZO PHENYL DYES

Peter Aeschlimann, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

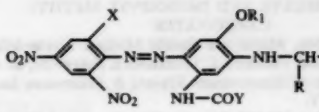
Continuation of Ser. No. 960,698, Nov. 14, 1978, abandoned. This application Mar. 17, 1980, Ser. No. 130,795

Claims priority, application Luxembourg, Nov. 21, 1977, 78553

Int. Cl.³ C09B *29/085;* **D06P** *1/18, 3/26, 3/54*

U.S. Cl. 260—207 **11 Claims**

1. A monoazo dye of the formula



in which

X is chloro, bromo or cyano;

R is alkyl of 1 to 4 carbon atoms which is unsubstituted or substituted by bromo, chloro, cyano, lower alkoxy or phenoxy;

R_1 and R_2 are independently alkyl of 1 to 4 carbon atoms which is unsubstituted or substituted by lower alkoxy, phenoxy or phenyl, or is phenyl, tolyl, chlorophenyl, tert-butylphenyl or dimethylphenyl;

Y is lower alkyl or lower alkoxy; and

n is an integer of at most 4.

4,447,360

INTERMEDIATES FOR THIA-AZA COMPOUNDS WITH A β-LACTAM RING

Jacques Gosteli, Basel; Ivan Ernest, Birsfelden, both of Switzerland, and Robert B. Woodward, Cambridge, Mass., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

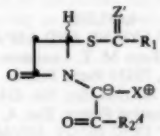
Division of Ser. No. 902,639, May 4, 1978, Pat. No. 4,331,676. This application Dec. 8, 1980, Ser. No. 214,316

Claims priority, application Luxembourg, May 9, 1977, 77306

Int. Cl.³ C07D *205/08, 401/12, 405/12, 409/12*

U.S. Cl. 260—239 A **3 Claims**

1. Compounds of the formula



(II)

in which Z' represents oxygen, sulphur or a methylidene group optionally carrying one or two substituents selected from the group consisting of lower alkyl, cycloalkyl, cycloalkyl-lower alkyl, phenyl, phenyl-lower alkyl, lower alkoxycarbonyl, carbamoyl or cyano, R_1 represents hydrogen, lower alkyl, lower alkyl monosubstituted by hydroxy, lower alkoxy, lower alkanoyloxy, halogen, lower alkylthio, carboxyl, lower alkoxycarbonyl, carbamoyl, cyano, nitro, amino, mono- or di-lower alkylamino, lower alkylene-amino or amino acylated by benzyloxycarbonyl, p-nitrobenzyloxycarbonyl or phenoxyacetyl; lower alkoxycarbonyl; aryl-lower alkoxycarbonyl; aryloxycarbonyl; aminocarbonyl; mono- or di-lower alkylaminocarbonyl; cycloalkyl, cycloalkyl-lower alkyl; phenyl; naphthyl; phenyl-lower alkyl; phenyl or phenyl-lower alkyl mono-substituted by lower alkyl, lower alkoxy, halogen, nitro or amino; pyridyl; thienyl; furyl; pyridyl-lower alkyl; thienyl-lower alkyl; furyl-lower alkyl; lower alkylthio; lower alkenylthio; cycloalkylthio; cycloalkyl-lower alkylthio; phenylthio; phenyl-lower alkylthio; or lower alkylthio, lower alkenylthio, cycloalkylthio, cycloalkyl-lower alkylthio, phenylthio or phenyl-lower alkylthio mono-substituted by hydroxy, lower alkoxy, lower alkanoyloxy, halogen, mercapto, lower alkylthio, carboxyl, lower alkoxycarbonyl, carbamoyl, cyano, nitro, amino, mono- or di-lower alkylamino, lower alkanoylamino or lower alkyleneamino, $X^{\oplus}$ represents triarylphosphonio, tri-lower alkylphosphonio or a phosphono group esterified twice by lower alkyl together with an alkali metal cation, and R_2' represents lower alkoxy, lower alkenyloxy, 2-halo-lower alkoxy, 2-lower alkylsulphonyl-lower alkoxy, 1-phenyl-lower alkoxy; 1-phenyl-lower alkoxy monosubstituted or disubstituted by lower alkoxy or nitro; pentachlorophenoxy, acetonyloxy, 2-cyanoethoxy, 2-tri-lower alkylsilylethoxy, 2-triphenylsilylethoxy or tri-lower alkylsilyloxy, in racemic or optically active form.

4,447,361

ARYL SUBSTITUTED PYRIDO[1,4]BENZODIAZEPINES

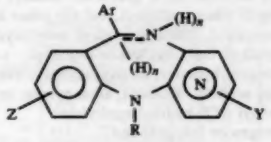
Chandler R. Taylor, Jr., Mechanicsville, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

Continuation-in-part of Ser. No. 305,080, Sep. 24, 1981, abandoned. This application Jul. 6, 1982, Ser. No. 395,218

Int. Cl.³ C07D *471/04*

U.S. Cl. 260—244.4 **34 Claims**

1. A compound selected from the group having the formula:



wherein:

R is $-alk^1-N-R^1R^2$;

R^1 and R^2 are selected from the group consisting of hydrogen and loweralkyl;

Ar is selected from the group consisting of 2, 3 or 4-pyridinyl, 2 or 3-thienyl, phenyl or phenyl substituted by 1 to 3 radicals selected from halogen, loweralkyl, loweralkoxy, trifluoromethyl or nitro and may be the same or different;

alk^1 is a straight or branched hydrocarbon chain of 1–8 carbon atoms;

Z is selected from the group consisting of hydrogen, halogen, loweralkyl, loweralkoxy, hydroxy or nitro;

Y is selected from the group consisting of hydrogen or 1–2 radicals selected from loweralkyl, loweralkoxy or hydroxy and may be the same or different;

n is 0 or 1 and when n is zero the dotted line is a double bond, and the pharmaceutically acceptable acid addition salts thereof.

4,447,362

PROCESS FOR THE PRODUCTION OF COENZYME Q

Kiyoshi Watanabe; Satoshi Ideguchi; Masahiro Ogura; Masahiko Shimada, and Hajime Kawaharada, all of Hyogo, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 8, 1977, Ser. No. 831,426

Claims priority, application Japan, Sep. 14, 1976, 51-110435

Int. Cl.³ C07C *46/10, 50/06*

U.S. Cl. 260—396 R **4 Claims**

1. A process for producing coenzyme Q from tissues of animals and plants or microbial cells which contain coenzyme Q and which comprises treating a water suspension of said materials with a mineral acid and then with an alkali in the absence of an alcohol and an antioxidant, extracting the alkali-treated suspension with at least one water-immiscible organic solvent, and isolating coenzyme Q from the extract.

4,447,363

ANDROSTENE-17-DITHIOKETALS

Ravi K. Varma, Belle Mead, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

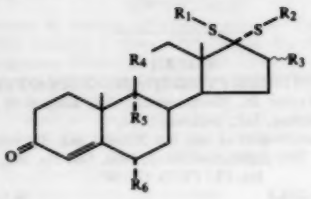
Filed Jul. 7, 1982, Ser. No. 396,178

The portion of the term of this patent subsequent to Nov. 30, 1999, has been disclaimed.

Int. Cl.³ C07J *1/00*

U.S. Cl. 260—397.3 **16 Claims**

1. A steriod having the formula



or 1,2-, 6,7- and 15,16-dehydro derivatives thereof, wherein

one of R_1 and R_2 is alkyl, cycloalkyl, aryl, arylalkyl, or $-CH_2X$ wherein X is alkylthio, alkoxy, alkanoyloxy, aroyloxy or alkoxycarbonyl, and the other is alkylthioalkyl, alkoxyalkyl, alkanoyloxyalkyl, aroyloxyalkyl, alkoxycarbonylalkyl, carbonylalkyl or arylalkyl;

R_3 is hydrogen, hydroxy, alkoxy, aryloxy, oxo, methylene, alkylthio, arylthio, alkanoyl, alkanoyloxy, or halogen;

R_4 is carbonyl or β-hydroxymethylene;

R_5 is hydrogen or halogen; and

R_6 is hydrogen, methyl, hydroxy, alkanoyl or halogen.

4,447,364

METHOD FOR THE PREPARATION OF LIQUID ALUMINUM CITRATE

Philip W. Staal, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 295,227, Aug. 21, 1981, which is a continuation-in-part of Ser. No. 153,766, May 27, 1980. This application Jan. 27, 1983, Ser. No. 461,467

Int. Cl.³ C07D *103/04;* **C07F** *5/06*

U.S. Cl. 260—448 R **7 Claims**

1. A method for the preparation of an aqueous solution of an aluminum citrate complex which consists essentially of the following steps:

(a) providing an aqueous solution of $AlCl_3$ containing up to about 34 weight % $AlCl_3$;

(b) combining the $AlCl_3$ solution with an aqueous solution of citric acid containing up to about 50 weight % citric acid, while vigorously agitating the resultant solution, to form an aluminum citrate solution having a mole ratio of aluminum ion to citric acid molecule of from about 1.5:1 to 2.0:1, said $AlCl_3$ solution being provided in an amount sufficient to form an aluminum citrate solution containing from 1 up to about 3 weight % aluminum; and

(c) adding a basic hydroxide of the formula MOH where M is an alkali metal or ammonium cation to the aluminum citrate solution, while continuing to agitate the solution and while maintaining its temperature within the range of from 20° C. to 90° C., in sufficient quantity to raise the pH of the solution to a level of from 5.5 to 7.5.

7. A method for the preparation of a stable liquid aluminum citrate which consists essentially of the following steps:

(a) providing an aqueous solution of aluminum chloride containing up to about 34% (w/w) of aluminum chloride;

(b) combining the aluminum chloride solution with an aqueous solution of citric acid containing up to about 50% (w/w) citric acid while providing vigorous agitation to form a solution of aluminum citrate containing from 1 to about 3 weight % aluminum and having a mole ratio of aluminum ion to citric acid molecule of from about 1.5:1 to about 2:1; and

(c) adding a 50% (w/w) solution of sodium hydroxide to the aluminum citrate solution, while continuing to provide vigorous agitation and maintaining the temperature of the resultant at a level of from 40° C. to 60° C., to raise the pH to a level of from 6.0 to 7.0.

4,447,365

2-ETHYL HEXYL AND ISOBORNYL METHYL CARBONATES

Richard M. Boden, Monmouth Beach; Michael Licciardello, Farmingdale, and Theodore J. Tyszkiewicz, Sayreville, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

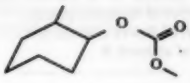
Division of Ser. No. 322,872, Nov. 19, 1981, Pat. No. 4,390,463. This application Jan. 18, 1983, Ser. No. 458,964

The portion of the term of this patent subsequent to Jul. 26, 2000, has been disclaimed.

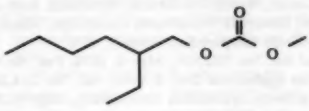
Int. Cl.³ C07C *69/96;* **A61K** *7/46*

U.S. Cl. 260—463 **2 Claims**

1. The methyl carbonate having the structure:



2. The methyl carbonate having the structure:



4,447,366

DERIVATIVES OF LYSINE AND ASPARTIC ACID

Jean V. Morelle, and Eliane M. T. Lauzanne-Morelle, both of 170, Ave. Parmentier, 75010 Paris, France

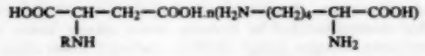
Filed Nov. 23, 1981, Ser. No. 324,004

Claims priority, application France, Dec. 4, 1980, 80 25732

Int. Cl.³ C07C *101/24, 101/26*

U.S. Cl. 260—501.11 **2 Claims**

1. A derivative of lysine and aspartic acid having the general formula



in which R represents an acyl group having from 6 to 26 carbon atoms and n is 2 and in which the acyl group is derived from an aliphatic moncarboxylic acid.

4,447,367

PHOSPHONOFORMALDEHYDE, A PROCESS FOR ITS PREPARATION AND ITS USE AS AN INTERMEDIATE PRODUCT FOR THE PREPARATION OF MEDICAMENTS

Hermann Oediger, Cologne; Folker Lieb, Leverkusen, and Hans Disselnkötter, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

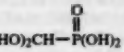
Division of Ser. No. 308,717, Oct. 5, 1981, Pat. No. 4,348,332. This application Apr. 22, 1982, Ser. No. 370,890

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1980, 3039998

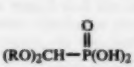
Int. Cl.³ C07F *9/38*

U.S. Cl. 260—502.4 R **2 Claims**

1. A process for the production of the compound of the formula



which comprises warming a dialkoxymethanephosphonic acid of the formula



in which

both radicals R represent an alkyl group with 1 to 4 carbon atoms, with water to a temperature in the range from +70° to +100° C., and if it is desired to convert the free phosphonoformaldehyde into a salt thereof, reacting the free phosphonoformaldehyde with a base.

4,447,368

PROCESS FOR THE PREPARATION OF AMINOARYLSULPHONIC ACIDS IN SULFOLENE SOLVENT

Herbert Emde, Cologne; Heinz U. Blank, and Peter Schnegg, both of Odenthal, all of Fed. Rep. of Germany, assignors to Siemens-Allis, Inc., Atlanta, Ga.

Filed Mar. 31, 1982, Ser. No. 364,083

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1981, 3114830

Int. Cl.³ C07C *143/56, 143/64*

U.S. Cl. 260—508 **19 Claims**

1. A process for the preparation of an aminoarylsulphonic acid having a free or neutralized sulphonic acid group which comprises contacting an arylamine of the formula

in which

R^1 and R^2 independently of one another denote hydrogen, alkyl, aralkyl or aryl, or both together form, together with the N atom on which they are substituted, a nitrogen-containing heterocyclic structure and

Ar^1 represents an unsubstituted or substituted benzene, naphthalene, anthracene naphthoquinone or athraquinone skeleton or the skeleton of an aromatic heterocyclic structure,

at a temperature of 120° to 280° C. with a sulphonating agent in a reaction mixture consisting essentially of said arylamine, said sulphonating agent and an inert solvent, said inert solvent comprising tetramethylene sulphone.

4,447,369

ORGANOMAGNESIUM COMPOUNDS

Eugene C. Ashby, Atlanta, Ga., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 369,340, Apr. 16, 1982, abandoned, which is a continuation-in-part of Ser. No. 303,404, Sep. 18, 1981, abandoned. This application Apr. 25, 1983, Ser. No. 488,080

Int. Cl.³ C07F *3/02*

U.S. Cl. 260—665 R **25 Claims**

1. In a process for producing dialkylmagnesium having the same or different alkyl groups wherein magnesium and an alkyl halogenide or mixture of alkyl halogenides are reacted in an inert, ether-free dispersion medium, the improvement therein comprising the step of adding a relatively small amount of a cyclopentadiene compound to the reaction mixture whereby the settling rate of the solid co-product from the dialkylmagnesium solution is effectively increased.

4,447,370

SUPPLEMENTARY FUEL SUPPLY MECHANISM FOR INTERNAL COMBUSTION ENGINES

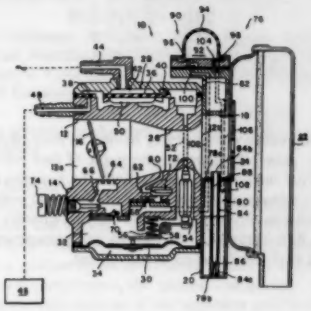
Hiroto Kobayashi, and Takeshi Kobayashi, both of Kawasaki, Japan, assignors to Walbro Far East, Inc., Kawasaki, Japan

Filed Jun. 21, 1982, Ser. No. 390,388

Claims priority, application Japan, Jul. 13, 1981, 56-108134

Int. Cl.³ F02M *1/16*

U.S. Cl. 261—35 **7 Claims**



1. A device which supplements the fuel supply for the starting and idle operation of an internal combustion engine and to be utilized in conjunction with a carburetor having a fuel chamber, a fuel and air mixing passage with an air inlet at one end and an engine outlet for fuel and air at the other end for supplying fuel to an engine during normal operation thereof which comprises:

(a) first means forming a supplemental fuel chamber adjacent the air inlet of a carburetor,

(b) orifice means in said supplemental fuel chamber opening to the air inlet of a carburetor to admit liquid fuel to said air inlet,

(c) third means to supply fuel to said supplemental fuel chamber,

(d) said first means comprising a housing forming an annular hollow chamber having an opening to register with the air inlet of said carburetor, and

(e) said orifice means comprising a tubular element radially disposed in said annular hollow chamber and having an open end forming a fuel orifice extending into said opening and a second open end communicating with the interior of said chamber.

4,447,371

CARBURETOR

Frank R. Busch, 1062 W. Maple Ave., Wauconda, Ill. 60084

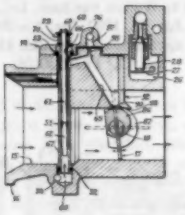
Filed Jun. 18, 1982, Ser. No. 390,069

Int. Cl.³ F02M *7/22*

U.S. Cl. 261—44 E **9 Claims**

1. A carburetor for internal combustion engines, comprising a main body having intake air passageway means of generally circular cross-section communication between atmospheric air and the intake manifold of the engine, a single planar throttle plate configured to fit the cross-section of said passageway means and mounted for limited rotational movement about an axis transverse of said passageway means to operably control the flow of air therethrough; a nozzle block extending into said passageway means in interfering relation with the rotational path of said throttle plate and having fuel introducing means at an outer end face thereof for introducing fuel substantially centrally into the stream of air flowing through said passageway means; said throttle plate having a cut away area extend-

ing inwardly of its periphery for registering reception of said nozzle block whereby to afford movement of said throttle plate over said block; and means cooperating with said nozzle block and moveable coaxially with said throttle plate and toward and away from said outer end face of said block to effectuate a variable size, convergent/divergent venturi passageway there-



between; said venturi passageway having its zone of maximum air velocity generally opposite the point of fuel introduction from said fuel introducing means with the vacuum effect of said venturi passageway being isolated from and independent of the engine's manifold vacuum and varying directly with the positioning of said throttle plate across said passageway means throughout said plate's range of movement.

4,447,372

METHOD AND APPARATUS FOR MOLDING PARTS HAVING AN ASPHERICAL SURFACE

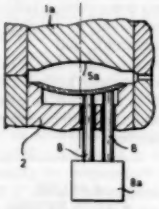
Albert Kreuttner, Aalen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Apr. 13, 1982, Ser. No. 367,920

Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117474

Int. Cl.³ B29D *11/00*; B29F *1/06*

U.S. Cl. 264—2.2 **13 Claims**



1. A method of forming a molded thermoplastic product having opposed surfaces at least one of which is aspherical, which method comprises selecting for the formation of said one surface a molding plate of elastically deformable material and having a spherical surface, selecting a mold having a molding-plate support for said plate in spaced opposed relation with a cavity formation for the other of said surfaces, the selected mold having a recessed region behind said support, mounting the selected plate on said support and over the recessed region, injecting thermoplastic material to fill said mold between said plate and said cavity formation and under sufficiently elevated pressure to elastically deform the surface of said plate to asphericity and to complete the molding of the product to such asphericity before removing the product from the mold.

4,447,373

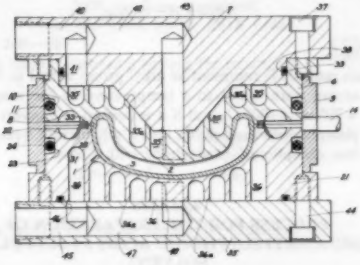
PROCESS FOR MAKING FILLED ARTICLES FROM POLYMERIC MATERIAL

Charles W. Chappell, West Chester, and Eldon G. Spletzer, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 16, 1982, Ser. No. 348,852

Int. Cl.³ B29C *6/00*

U.S. Cl. 264—4 **17 Claims**



1. A process of making a hollow article from moldable plastic material and filled with a filler substance comprising the steps of molding two parts using at least an exterior mold for each part, which parts, when joined at their peripheries, will constitute said article, causing said parts to remain in their respective exterior molds, bringing said exterior molds into opposed position, locating said filler substance in one of said parts, sealing said exterior molds together when in opposed position and prior to complete closure thereof, subjecting the space between the exterior molds with the parts therein to a partial vacuum, thereafter purging said space with a gas non-reactive to said filler material and said parts, and again subjecting said space to a partial vacuum prior to closing said exterior molds, closing said exterior molds and subjecting them to a clamping pressure to join said parts about their peripheries and to remove flash therefrom, heating parts at least of said exterior molds, cooling said exterior molds, opening said exterior molds and removing therefrom said article.

4,447,374

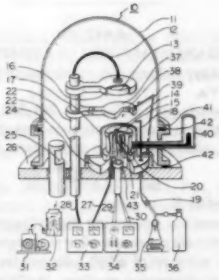
PREPARING REPLICA FILM OF SPECIMEN FOR ELECTRON MICROSCOPY

Akira Tanaka, Souka, Japan, assignor to The Tokyo Metropolitan Institute of Medical Science, Tokyo, Japan

Division of Ser. No. 100,280, Dec. 5, 1979, Pat. No. 4,334,844. This application Mar. 10, 1982, Ser. No. 356,734

Int. Cl.³ H05H *1/00*

U.S. Cl. 264—22 **2 Claims**



1. A method for preparing a replica of a specimen suitable

for use in transmission-type electron microscopy and which is in the form of a film comprising the steps of:

(a) providing an apparatus comprising a pair of electrodes, one being an upper positive electrode and the other being a lower negative electrode which parallelly face each other with a distance therebetween and which are arranged in a vacuum vessel on a base plate, said pair of electrodes being electrically and thermically insulated from the vacuum vessel and the base plate and being surrounded by minute discharge prevention cylinders;

(b) placing the specimen on the surface of the negative electrode;

(c) evacuating the atmosphere within the apparatus with a vacuum pump so as to produce a high vacuum of approximately from 10^{-5} to 10^{-6} Torr within the apparatus;

(d) introducing organic monomer vapors or a mixture thereof with a small amount of an inert or active gas into the apparatus to produce a gas pressure of approximately from 1 to 10^{-2} Torr in the apparatus;

(e) applying a direct discharge voltage of from 0.5 to 3 KV between said two electrodes for 1 to 15 minutes to effect a glow discharge, while the current density of the glow discharge is maintained between 0.1 and 2 mA/cm^2 by adjusting the flow rate of the organic monomer vapors to the apparatus and the flow rate of the evacuation gas from the apparatus, whereby a polymer substance film having a uniform thickness is formed on the surface of the specimen by the diffusion effect of plasma molecules;

(f) removing the specimen having the polymer substance film thereon from the apparatus after putting the pressure of the atmosphere within the apparatus back to an ordinary pressure; and

(g) dissolving the specimen in a solvent which does not dissolve the polymer substance film, but dissolves the specimen, to thereby separate the polymer substance film from the specimen.

4,447,375
METHOD OF CASTING A PRINTING HEAD FOR AN INK JET PRINTER

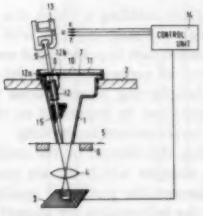
Hans Schimmelpfennig, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 11, 1983, Ser. No. 512,731

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1982, 3226746

Int. Cl.³ B29D *3/00*

U.S. Cl. 264—40.5 **7 Claims**



1. A method of casting a synthetic body forming a write head for an ink jet printer, said write head having micro channels connecting first and second different limiting surfaces thereof, the discharge openings of said micro channels on said first limiting surface having a smaller diameter and a closer spacing than on said second limiting surface; comprising the steps of; providing a casting mold having openings corresponding to said two surfaces, covering the opening corresponding to said one surface with a transparent film, covering the other said opening with a terminal plate having bores for accepting at least one mold needle into said casting mold, using a positioning tool for positioning said needles, optically scanning the tips of said needles for developing signals for controlling operation of said positioning tool, whereby the tips of said needles are correctly positioned relative to said one surface, fixing the points of the mold needles to the transparent film, and subsequently filling said mold with liquid synthetic casting material through at least one casting orifice in said terminal plate.

7. The method according to claim 1 including the step of providing at least one opening in said terminal plate for the escape of air during filling of the mold chamber.

4,447,376
MANUFACTURE OF ELECTROCHEMICAL HIGH TEMPERATURE CELLS

Tsvetko Chobanov, Frankfurt; Dieter Künze, Kelkheim, and Friedrich Woeffler, Frankfurt, all of Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Aug. 10, 1981, Ser. No. 291,410

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1980, 3032552

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—42 **17 Claims**

1. A manufacturing process for an electrochemical high temperature cell having a solid positive electrode, a solid negative electrode, a separator of finely divided ceramic material, and a molten liquid electrolyte which is retained within the said cell components, the process comprising

mixing starting material of the separator and/or of the electrodes with electrolyte powder and with a synthetic plastic which s decomposable without residue under heat, said starting material being electrode powder for the electrodes and being finely divided ceramic for the separator,

rolling the mixture into a cohesive plate of uniform thickness,

assembling the plates individually or after being rolled together into composite electrode(s)/separator plates into a cell, and

heating the cell after completed assembly above the decomposition temperature of the plastic so as to decompose said plastic without residue and below the operating temperature of the cell.

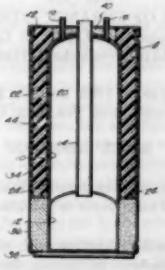
4,447,377
METHOD OF INSULATING THE EXTERIOR OF A WATER HEATER TANK

Donald W. Denton, Ashland City, Tenn., assignor to State Industries, Inc., Ashland City, Tenn.

Division of Ser. No. 283,983, Jul. 16, 1981, which is a continuation of Ser. No. 101,481, Dec. 10, 1979, abandoned. This application Mar. 1, 1982, Ser. No. 353,141

Int. Cl.³ B29D *27/04*

U.S. Cl. 264—45.2 **3 Claims**



1. The method of insulating a tank comprising the steps of:

(1) wrapping a plastic envelope around the exterior side wall of the tank;

(2) installing an outer jacket member around the tank and over the envelope, said jacket member dimensioned so that there will be a space between the tank side wall and the jacket member in which said envelope is positioned;

(3) installing a cover member on the top of the jacket member to close off the top of the jacket;

(4) introducing a foam-type insulation material into the envelope through an opening in the cover member, said material when introduced being in the form of a mixture of fluid components which will expand in the envelope and when set will produce a rigid wall of insulating material in the space between the tank wall and the jacket means; and

(5) plugging the opening in the cover member through which the foam-type insulation material is introduced.

4,447,378

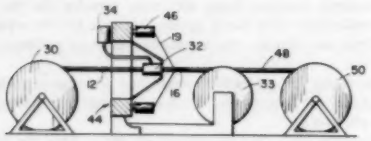
METHOD OF PRODUCING A COMPOSITE FOAM WIRE REINFORCED HOSE

Herbert W. Gray, Lawson, and Roger A. Payne, Excelsior Springs, both of Mo., assignors to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 246,516, Mar. 23, 1981, Pat. No. 4,380,252. This application Sep. 29, 1982, Ser. No. 426,319

Int. Cl.³ B29D *27/00*; **D03D** *3/02*

U.S. Cl. 264—45.9 **10 Claims**



1. A method for producing wire-reinforced hose comprising the steps of:

forming a self-supporting polymeric tube;

applying a coating of an expandable polymeric material onto the outer surface of the tube;

twining a tightly packed sheath of stranded wire reinforcement over the coated tube; interspaces being defined between the reinforcement and tube and between individual strands of the reinforcement; and

expanding the polymeric material into a cellular cushion matrix at least partially filling said interspaces.

4,447,379

PRODUCTION OF CERAMIC LITHIUM NITRIDE

Armin Wagner, Laubach, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Apr. 9, 1982, Ser. No. 366,858

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1981, 3123094

Int. Cl.³ B29H *7/20*

U.S. Cl. 264—61 **12 Claims**

1. A method of producing ceramic lithium nitride, particularly for use as solid electrolyte in galvanic lithium cells, comprising

stirring Li_3N powder together with molten Li-metal in a noble gas atmosphere, permitting the mixture to cool

compressing the cooled mixture into a shaped body, and

sintering the shaped body in a nitrogen stream.

4,447,380

EXPANDED INORGANIC AGGREGATE BONDED WITH CALCIUM SILICATE HYDRATE AS THERMAL INSULATION

Richard F. Shannon, Lancaster, and Jerry L. Helser, Hebron, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 16, 1981, Ser. No. 331,445

Int. Cl.³ C04B *13/10*

U.S. Cl. 264—82 **17 Claims**

1. A method for making a shaped rigid article of thermal insulation which undergoes less than 2% shrinkage within the temperature range of 1200°–1800° F., comprising the steps of:

(a) heating an aqueous slurry of calcareous and siliceous reactants at a temperature of at least 100° C. under superatmospheric pressure to form, by hydrothermal reaction thereof, a gel of calcium silicate hydrate crystals;

(b) mixing additional material comprising thermally expanded inorganic aggregate with said gel to form a molding mixture;

(c) molding, optionally comprising mechanically dewatering, at least a portion of said mixture to form a shaped greenware body; and

(d) drying said greenware body to form said article;

where neither said molding mixture nor said greenware body is treated with saturated steam to effect further hydrothermal reaction.

4,447,381

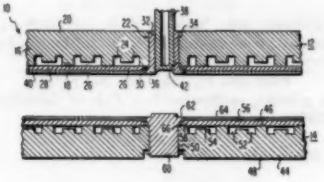
APPARATUS AND METHOD FOR MAKING A VIDEO DISC

James R. Matey, Mercerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 8, 1982, Ser. No. 440,243

Int. Cl.³ B29D *17/00*

U.S. Cl. 264—107 **10 Claims**



1. In a method for molding a video disc wherein a mold cavity is filled with a plastic material with the mold cavity being formed between two opposed mold members each having a stamper over its surface forming the mold cavity and each mold member having imperfections which may pass through the stamper and be impressed on the surface of the molded disc, the improvement comprising

relatively rotating the stamper on the mold member so that areas of the stamper which do not contain information which will impact the perceived quality of the picture provided by the information are aligned with said imperfections in the mold members.

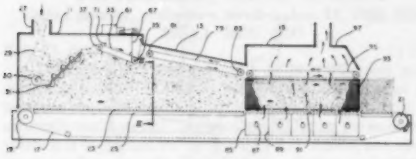
6. In an apparatus for molding a video disc which includes a pair of opposed mold members each having a mold cavity in its surface which faces the other mold member, a stamper mounted across each of the mold cavities, and each mold member having imperfections which may pass through the stampers and be impressed on the surface of the molded disc, the improvement comprising the circumferential position of the stampers with respect to the molds is arranged so that areas of the stamper which do not contain information which will impact the perceived picture quality are aligned with said imperfections in the mold members.

4,447,382

APPARATUS FOR MAKING FOAM CARPET PAD

Robert C. Spurlock, Forth Worth, Tex., and Larry W. Foster, Houston, Miss., assignors to MPI, Inc., Fort Worth, Tex.

Filed Feb. 8, 1982, Ser. No. 347,002
Int. Cl.³ B29D 27/00; B32B 5/16, 5/18, 27/40
U.S. Cl. 264—123 6 Claims



1. In a method for making a foam pad of the type that includes the steps of receiving in a hopper section foam particles coated with a heat activated bonding agent, moving a body of the particles from the hopper section into a precompressor section which has an inclined upper conveyor belt for compressing the particles, moving the particles into a heat section from the precompressor section for heating the particles, the improvement comprising:

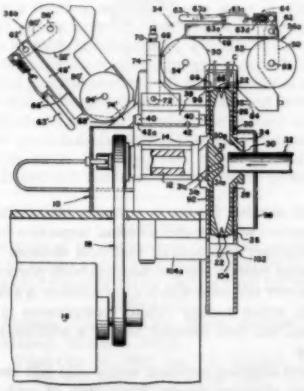
raking in the hopper section the top of the body of the particles in a direction opposite to the direction of travel of the body of particles, while tapering upwardly the corners of the body of particles at the top to provide a concave upper surface for the body of particles prior to entering the precompressor section.

4,447,383

METHOD OF CENTRIFUGALLY PELLETIZING CERTAIN SYNTHETIC PLASTIC MATERIALS

Harutun G. Karian, and David B. Todd, both of Saginaw, Mich., assignors to Baker Perkins Inc., Saginaw, Mich.

Filed Feb. 16, 1982, Ser. No. 348,829
Int. Cl.³ B29C 6/00
U.S. Cl. 264—8 2 Claims



1. A method for forming pellets of thermoplastic material comprising: centrifugally expressing strands of a visco-elastic thermoplastic material in a flowable state from orifices in the rim portion of a rotating hollow rotor by rotating the rotor through successive revolutions, severing said strands at a selected distance from said rim to form pellets; and controlling the mass of the pellets by locating a single strand severing member to extend across the general plane of movement of the expressed strands at a distance from said rim portion such that the visco-elastic retraction of the strands upon the severing of pellets therefrom is such that said strands are engaged by said severing member only on alternate revolutions of said rotor.

4,447,384

PROCESS FOR PRODUCING ANTIPILLING ACRYLIC SYNTHETIC FIBER

Hitoshi Tamura, Hiroshima, and Katsuhei Shigeoka, Yamaguchi, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jan. 12, 1982, Ser. No. 339,008
Claims priority, application Japan, Jan. 19, 1981, 56-6067
Int. Cl.³ D01F 6/18
U.S. Cl. 264—206 4 Claims

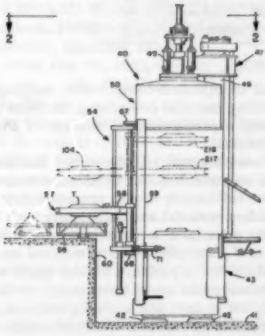
1. A process for producing an acrylic fiber having, as its characteristic properties, a tensile strength of 1.2–2.5 g/denier, a knot strength (g/denier)-knot elongation (%) product of 25 or less and a boiling water shrinkage rate of 5% or less which comprises dry-spinning a spinning solution of an acrylonitrilic polymer containing 85% or more of acrylonitrile, stretching the resulting fiber in hot water at a stretch ratio ranging from 1 to 2, then subjecting the fiber to a drying-relaxing treatment to give it a shrinkage of 10–40% and further stretching it at a temperature of 180°–210° C. at a stretch ratio of 1.2–2.3.

4,447,385

TIRE PRESS, LOADER AND METHOD

Virgil Y. Blosser; G. E. Isaksson, both of Canfield; Dallas B. Rupp, Lisbon, and A. P. Singh, Youngstown, all of Ohio, assignors to NRM Corporation, Akron, Ohio

Filed Aug. 1, 1983, Ser. No. 519,072
Int. Cl.³ B29H 5/02
U.S. Cl. 264—315 39 Claims



1. A tire press comprising upper and lower mold parts including respective bead seats, means vertically to separate the mold parts for opening the press, loader means to position a green tire between said mold parts when open, means to transfer the green tire from the loader means to the press with the upper bead secured against the upper bead seat, and means partially to close the press after the loader means has released the green tire and cleared the mold parts to bring the lower bead of the green tire into contact with the lower bead seat, and means to shape the green tire and finally close the press.

28. A method of loading and shaping a green tire in a tire press for final shaping and vulcanizing comprising the steps of:

(a) using a loader to position the green tire in axial alignment with the lower mold section of the press;

(b) then securing the green tire to the press head with the top bead held against the upper bead seat;

(c) then withdrawing the loader from the press after releasing the green tire;

(d) then lowering the press head while thus holding such top

bead to bring the bottom bead of the green tire against the lower bead seat; and

(e) then bladder shaping the green tire as the press finally closes.

4,447,386

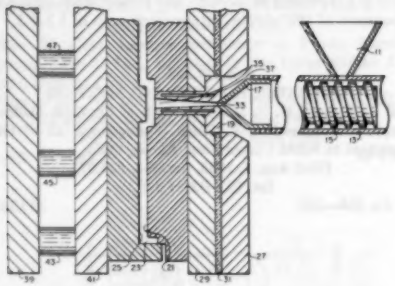
PROCESS FOR RUNNERLESS INJECTION - COMPRESSION MOLDING OF THERMOSETTING MATERIALS

W. Andrew Dannels, Grand Island, N.Y., and Robert W. Bainbridge, Gainsville, Ga., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Division of Ser. No. 278,238, Jun. 29, 1981, Pat. No. 4,370,123, which is a continuation-in-part of Ser. No. 118,281, Feb. 5, 1980, Pat. No. 4,290,744, which is a continuation-in-part of Ser. No. 972,182, Dec. 21, 1978, abandoned, and a continuation-in-part of Ser. No. 164,412, Jun. 30, 1980, Pat. No. 4,309,319, which is a continuation-in-part of Ser. No. 972,189, Dec. 21, 1978, Pat. No. 4,238,181. This application Oct. 6, 1982, Ser. No. 433,061

Int. Cl.³ B29G *3/00*

U.S. Cl. 264—328.2 **7 Claims**



1. A method of injection-compression molding an article from thermosetting material comprising the steps of:

(a) plasticizing a predetermined amount of thermosetting molding material,

(b) passing said amount of plasticized molding material through a temperature-controlled zone maintained at a temperature sufficiently low to prevent substantial curing of the molding material and sufficiently high to maintain the molding material in a plasticized condition,

(c) injecting said plasticized molding material into a partially open mold cavity to partially fill the space between the mold faces, said mold cavity being maintained at a temperature sufficient to cure said molding material,

(d) completely closing said mold faces to compress and cure the molding material in the internal configuration of said mold but not in said temperature controlled zone, and

(e) remove the cured, molded article from the mold.

4,447,387

PROCESS FOR MANUFACTURE OF TUBULAR FILM

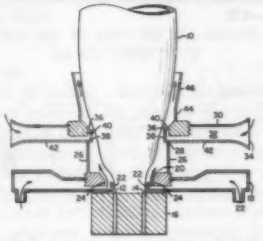
Theodore R. Blakeslee, III, Hillsborough, and Randall Wu, Matawan, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 30, 1982, Ser. No. 430,370

Int. Cl.³ B29D *7/22*

U.S. Cl. 264—566 **13 Claims**

1. A process for forming a blown film from a thermoplastic resin which comprises extruding said resin through the die lips of a tubular film die to form a film tube, expanding said film tube and directing a pressurized cooling medium in initial contact with said film tube, passing said cooling medium through a chamber surrounding said film tube, providing an air collar on the downstream edge of said chamber said air collar having discharge means for discharging cooling air substantially in the direction of film travel, and having an air conduit leading from the atmosphere to said discharge means, passing said cooling medium past said discharge means to create a reduced pressure zone proximate said discharge means and said film tube, providing a source of flow of cooling air, said



cooling air being induced to flow from the atmosphere at a velocity of about 1 to 15 ft/sec. through said air conduit as a result of the differential pressure between the atmosphere and said reduced pressure zone said induced air exiting said discharge means substantially in the direction of film travel.

4,447,388

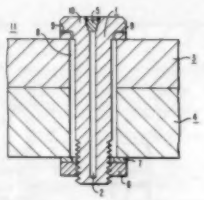
BOLT FAILURE DETECTION

Harry G. Sutton, Jr., Pittsburgh, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 30, 1981, Ser. No. 325,880

Int. Cl.³ G21C *17/00*

U.S. Cl. 376—245 **4 Claims**



1. A bolt member for use in normally inaccessible parts of nuclear reactors which makes a normal inspection for cracks in the bolt member impractical, said bolt member having an enlarged head portion and a cylindrical body portion having a threaded lower end onto which a nut member is adapted to be screwed to retain nuclear reactor components in operative relationship, said bolt member having a bolt-crack indicator comprising:

an elongated chamber provided within said bolt member, said elongated chamber during fabrication of said bolt-crack indicator having an entry portion opening from an exposed surface of the enlarged head portion of said bolt member, tag gas having been introduced into said elongated chamber through the entry portion thereof during fabrication of said bolt-crack indicator, and a plug sealing the entry portion of said elongated chamber and sealing said tag gas within said elongated chamber, whereby a developed crack in said bolt member which permits tag gas within said chamber to escape to the environment outside said bolt member provides evidence of such crack in said bolt member.

4,447,389

METHOD FOR MANUFACTURING TUBES BY SINTERING

Lars M. Bruce, Viken, Sweden, assignor to Uddeholms Aktiebolag, Hagfors, Sweden

PCT No. PCT/SE81/00173, 371 Date Feb. 2, 1982, 102(e) Date Feb. 2, 1982, PCT Pub. No. WO81/03633, PCT Pub. Date Dec. 24, 1981

PCT Filed Jun. 10, 1981, Ser. No. 355,552

Claims priority, application Sweden, Jun. 11, 1980, 8004338

Int. Cl.³ B22F *3/00*

U.S. Cl. 419—6 11 Claims

1. A method for manufacturing tubes comprising molding sinterable powder of metallic material into the shape of a tube between opposed molding surfaces, one of which is the outer circumferential surface of a mandrel, sintering the molded tube while it is supported by the mandrel and, during one sintering stage, sealing the tube by infiltrating therein an infiltratable material which is liquid or liquified at a temperature lower than the maximum sintering temperature used and which is capable of wetting the metal powder particles and of solidifying when the temperature is lowered, the tube being formed with one of its inner or outer circumferential surfaces as a layer of a relatively fine-grained sinterable metallic powder and the rest of the tube being formed of a sinterable metallic powder which is coarser than the fine-grained metal powder, the infiltration of the tube being effected by means of infiltratable material of a nature such that it forms a bond of infiltratable material between the fine grains of the surface as well as between the coarse grains of the rest, and the infiltration being carried out in a direction from the coarse powder towards and into the fine powder while a molding surface is in contact with the fine powder surface that has been formed, and remains in contact with the tube during sintering to shape infiltrating material which penetrates into contact with said molding surface.

2. A method of manufacturing tubes comprising the steps of

forming an inner tube wall layer of sinterable metallic powder on a mandrel,

forming an outer tube wall layer of sinterable metallic powder on the inner layer, the grain size of the powders formed as the inner and outer layers being unequal such that one layer has a grain size that is coarse and the other layer has a grain size that is fine,

providing a forming surface for the layer of fine grained powder while sintering the tube wall and infiltrating therein an infiltratable material which is liquid or liquifiable at the sintering temperature and is capable of wetting the metal powder particles and which solidifies at temperatures below the sintering temperature and forms a bond of infiltratable material between fine-grained and coarse-grained particles, said infiltration being carried out in a direction from the layer of coarse-grained powder towards and into the layer of fine-grained powder.

4,447,390

METHOD FOR HOT-CONSOLIDATING POWDER USING STAGED TEMPERATURE AND PRESSURE CAUSING COMPACTION FROM THE OUTSIDE INWARD

Walter J. Rozmus, Traverse City, Mich., assignor to Kelsey Hayes Company, Romulus, Mich.

Filed Oct. 26, 1981, Ser. No. 315,025

Int. Cl.³ B22F *3/14;* F27D *7/00*

U.S. Cl. 419—49 4 Claims

1. A method for hot consolidating powder of metallic and nonmetallic compositions and combinations thereof to form a densified compact at a predetermined temperature and pressure at which the powder is transformed into a compact, said method comprising the steps of: filling the cavity of a container with a powder to be compacted, hermetically sealing the container, subjecting the container to an intermediate gas pressure by inclusion of a predetermined amount of gas in a sealed container and sealing the container against gas flow into and out of the container to maintain the predetermined amount of gas within the sealed chamber, heating the container and the gas sealed within the chamber to raise the pressure of the gas within the sealed chamber in response to the increase of temperature thereof to reach the predetermined temperature and the predetermined pressure solely by the addition of heat to cause compaction of the powder from the outside to the inside as the outermost powder reaches the predetermined temperature and predetermined pressure for compaction before the innermost powder so that the compaction pressure is reached solely as a function of the heat input.

4,447,391

BRAZING ALLOY CONTAINING REACTIVE METALS, PRECIOUS METALS, BORON AND NICKEL

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Dec. 10, 1982, Ser. No. 448,582

Int. Cl.³ C21C *5/02, 5/04, 19/03*

U.S. Cl. 420—456 6 Claims

1. A brazing alloy consisting essentially of from about 0.1% by weight to about 5% by weight of a reactive metal selected from the group consisting of titanium, zirconium, vanadium and mixtures thereof, from about 0.05% by weight to about 4% by weight of boron, from about 15% by weight to about 85% by weight of nickel, from about 0% to about 30% by weight chromium, balance a precious metal selected from the group consisting of gold, palladium and mixtures thereof, said precious metal being present in amounts of from about 5% by weight to about 85% by weight.

4,447,392

DUCTILE SILVER BASED BRAZING ALLOYS CONTAINING A REACTIVE METAL AND MANGANESE OR GERMANIUM OR MIXTURES THEREOF

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Dec. 10, 1982, Ser. No. 448,583

Int. Cl.³ C22C *5/06*

U.S. Cl. 420—501 5 Claims

1. A brazing alloy consisting essentially of from about 0.25% to about 5% by weight of titanium, from about 4% to about 20% by weight of a third metal selected from the group consisting of germanium, manganese and mixtures thereof and the balance silver.

4,447,393

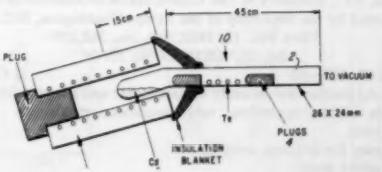
OXIDE-FREE CDTE SYNTHESIS

Donald F. Weirauch, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 9, 1983, Ser. No. 465,129

Int. Cl.³ C22C *1/02, 20/00*

U.S. Cl. 420—590 8 Claims



1. A method for compounding CdTe, comprising the steps of:

providing high-purity cadmium and Te;

distilling said high-purity Cd under a vacuum; and

compounding said Cd and Te to form a melt of CdTe;

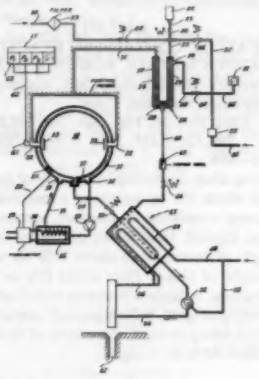
wherein said Cd is maintained under vacuum continuously from said distillation step through said compounding step.

4,447,394

METHOD FOR STERILIZATION WITH FORMALIN

Jan K. Krouthén, Halmstad, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Continuation-in-part of Ser. No. 182,214, Aug. 28, 1980, abandoned, which is a division of Ser. No. 951,526, Oct. 16, 1978, abandoned. This application Aug. 1, 1983, Ser. No. 518,761
Claims priority, application Sweden, Oct. 17, 1977, 77116606
Int. Cl.³ A61L *2/20, 2/06*
U.S. Cl. 422—27 **5 Claims**



1. A method of sterilizing articles in a heated autoclave chamber having an atmosphere of formaldehyde and water vapor while preventing the formation of formalin and/or paraformaldehyde residues in the autoclave chamber and comprising the steps of: supplying a given quantity of formalin through a conduit to a vaporizer having a jacket surrounding it, the vaporizer being formed as a liquid trap for receiving said quantity of formalin and preventing overflow of liquid from said quantity out of the vaporizer, heating said jacket to 110° C. to thereby transform said formalin into water vapor and formaldehyde in said vaporizer, and passing said water vapor and formaldehyde through a vapor conduit to said autoclave chamber, said vapor conduit being maintained at a temperature above the temperature of said chamber atmosphere and exposing articles to be sterilized to said formaldehyde and water vapor at a temperature elevated above room temperature for a period of time sufficient to sterilize said articles, whereupon the formaldehyde-water vapor mixture is removed from said autoclave chamber.

4,447,395

SAMPLING DEVICE

Donald G. Englar, Frederick, Md., and Robert G. Altman, Mauldin, S.C., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 12, 1982, Ser. No. 348,539
Int. Cl.³ G01N *33/00, 35/04*
U.S. Cl. 422—68 **2 Claims**

1. Apparatus that is easily transportable and adapted for field use in military operations, said apparatus comprising:

a base,

a tray for holding samples,

a probe arm,

a drive shaft,

means for mounting said drive shaft for rotation on said base,

means connecting said drive shaft with said probe arm relative to said tray for cooperating with at least a portion of said samples and for reciprocating said probe arm along a path transverse to said tray and for swinging said probe arm transversely to said path during one revolution of said drive shaft,

means connecting said drive shaft with said tray for indexing said tray to place said samples in a position for cooperation with said probe arm comprising a support shaft disposed transversely to said base and having one end removably attached to said tray and the other end mounted on said base for rotation with respect thereto,

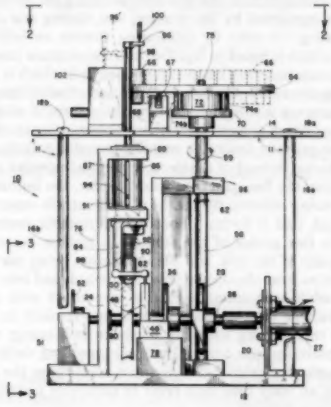
a Geneva gear rigidly attached to said support shaft, and

a first indexing disk rigidly attached to said drive shaft and operatively associated with said Geneva gear for sequentially rotating said support shaft,

said means connecting said drive shaft with said probe arm for swinging said probe arm comprises:

a second indexing disk rigidly attached to said drive shaft,

a block slidably mounted on said base and operatively associated with said second indexing disk for recriprocal translation of said block between a first position and a second position,



a follower arm attached to said probe arm,

a brace rigidly mounted on said base for supporting said follower arm,

a pin fixed on said follower arm,

a sleeve formed with a slot and slidably disposed on said follower arm with said pin seated in said slot for simultaneously allowing independent translation of said follower arm inside said sleeve and concurrent rotation of said follower arm with said sleeve, and

means operatively connecting said block with said sleeve for transmitting the reciprocal translation of said block into rotation of said sleeve whereby said probe arm reciprocally swings toward and away from said samples.

4,447,396

SYSTEM FOR DISCRIMINATING A PRECIPITATION PATTERN OF PARTICLES

Tokio Kano, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1982, Ser. No. 337,068
Int. Cl.³ G01N *33/54, 35/02*
U.S. Cl. 422—73 **9 Claims**

1. A system for discriminating a precipitation pattern of particles, comprising:

a transparent reaction container having a bottom inner surface, part of which is inclined at a predetermined angle and on which a precipitation pattern of particles to be examined is formed based on immunological agglutination;

a light source for illuminating the bottom inner surface of said reaction container;

a lens for projecting an image of the precipitation pattern formed on the bottom inner surface of said reaction con-

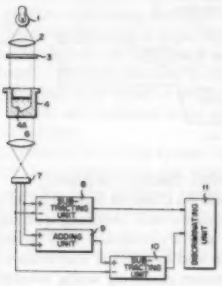
tainer and composed of first, second and third image sections which correspond to the lowest, middle and highest regions of the precipitation pattern;

at least one first photodetecting element for detecting the first image section;

at least one second photodetecting element for detecting the second image section;

at least one third photodetecting element for detecting the third image section;

first generating means for generating a first detection signal which corresponds to a difference between output signals supplied from said first and third photodetecting elements respectively;



second generating means for generating a second detecting signal which corresponds to a difference between an output signal supplied from one of said first and third photodetecting elements and an output signal supplied from said second photodetecting element;

first comparing means for comparing the second detecting signal with a reference signal to generate a correction signal; and

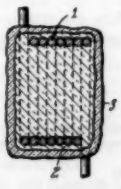
second comparing means for comparing both the first and second signals to the correction signal to discriminate the precipitation pattern.

4,447,397

CATALYTIC GAS SENSOR

Abraham Y. Anouchi, Aspinwall; Robert L. Novack, Evans City, and Beth Tomasovic, Butler, all of Pa., assignors to Bacharach Instrument Company, Pittsburgh, Pa.

Filed Aug. 5, 1982, Ser. No. 405,449
Int. Cl.³ G01N *27/16*
U.S. Cl. 422—94 **3 Claims**



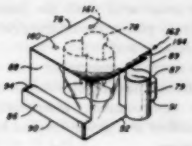
1. A reference element for a catalytic gas sensor comprising an electrically conductive filament coated with an electrically insulating first layer of Al_2O_3, a second layer of titanium dioxide coated upon said first layer and containing inorganic binder, the inorganic binder representing up to about 10% by weight of the second layer and the balance being titanium dioxide, said filament coated with said first and second layers being encased in a glass bead so as to produce a reference element with improved life and durability.

4,447,398

SAMPLE CONTAINER FOR MEASUREMENT OF IONS OF BODY FLUIDS

Henry D. Schwartz, Palo Alto; Irwin H. Krull, Santa Clara; Carl P. Clement, Los Altos Hills; Frederick H. Stengel, Palo Alto, and David D. Hayslett, San Jose, all of Calif., assignors to Sequoia Turner, Mountain View, Calif.

Division of Ser. No. 183,983, Sep. 4, 1980, Pat. No. 4,350,579. This application Nov. 9, 1982, Ser. No. 319,474
Int. Cl.³ B01L *3/00*
U.S. Cl. 422—102 **13 Claims**



1. An integral plastic container for use in a testing apparatus for use in the clinical measurement of ions of body fluids to be tested in which a plurality of electrodes are dipped into the fluids to perform the desired measurements in the container while the container rests in a detent within the apparatus, the container comprising:

a base

a plurality of walls extending upwardly from the base defining inner facing surfaces,

flange means associated with the base cooperating with the detent means within the testing apparatus whereby the container is held in its proper position within the testing apparatus,

the inner facing surfaces of the upwardly extending walls defining a sampling chamber having an upper open mouth, and

handle means extending outwardly from said container and sized to be gripped by the fingers of a user,

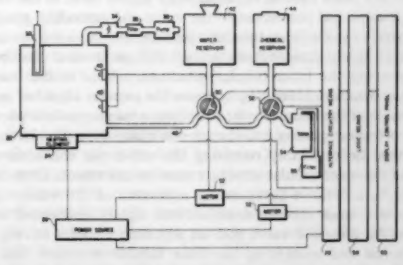
said sampling chamber being sized to fit within an volume of 1 inch by 1 inch by 1 inch.

4,447,399

COMBINATION STEAM AND UNSATURATED CHEMICAL VAPOR STERILIZER

Robert R. Runnells, Kaysville; Peter A. Haak, Salt Lake City; Rodney B. Larkin, Kaysville, and C. Keith Vandervelden, Salt Lake City, all of Utah, assignors to MDT Chemical Company, Gardena, Calif.

Filed May 7, 1981, Ser. No. 261,506
Int. Cl.³ A61L *2/20, 2/24*
U.S. Cl. 422—113 **19 Claims**



1. A combination steam and unsaturated chemical vapor sterilizer comprising:

a fixed volume impervious pressure chamber structured to accommodate materials placed therein for sterilizing;

access means associated with the chamber for the insertion into or removal of materials from the chamber;

a source of liquid sterilizing chemicals;

a source of liquid water;

transport means to selectively convey either liquid sterilizing chemicals or liquid water from their respective sources to the interior of the chamber;

a heating element structured uniformly to heat the interior of the chamber, thereby to vaporize said water or sterilizing chemicals within said chamber;

a power source associated with the heating element and transport means to power the heating element and to drive the transport means; and

switching means operably associated with the power source, transport means and heating element to control the chemical or water environment, temperature and pressure within the chamber at a given time in accordance with a preselected setting.

4,447,400

METERING DEVICE

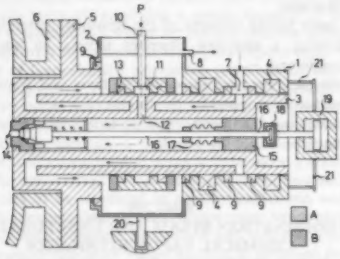
Hans-Werner Stephan, Cologne; Hermann Klein, and Klaus Lehr, both of Hürth, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 29, 1982, Ser. No. 362,978

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1981, 3113705

Int. Cl.³ C01B *25/023;* B01J *4/00*

U.S. Cl. 422—150 **6 Claims**



1. A device for metering liquid yellow phosphorus into a rotating ball mill for the production of red phosphorus therein, comprising an inner tubular structure rigidly connected to the rotating ball mill and an outer tubular structure partially concentrically surrounding the inner tubular structure, a valve within the inner tubular structure near its end close to the ball mill, a valve rod connected to the valve and extending generally parallel to the inner tubular structure, the valve rod having a disk at its end remote from the ball mill, an annular chamber surrounding the inner tubular structure, a bore in the inner tubular structure extending between the annular chamber and the inside of the inner tubular structure, a tubular yellow phosphorus feeder opening into the annular chamber, a plug having a central bore slidably receiving the valve rod and secured within the inner tubular structure near its end remote from the ball mill, a bellows surrounding a portion of the valve rod inside the inner tubular structure and tightly connected between the plug and valve rod, an adjusting element having a thrust rod and secured to the outer tubular structure, and a clutch connected to the thrust rod and rotatably receiving the disk of the valve rod whereby the valve is opened upon activation of the adjusting element.

4,447,401

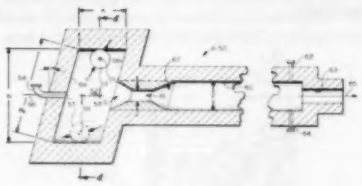
CARBON BLACK REACTOR WITH ANGLED COMBUSTION CHAMBER AND NON-ALIGNED TANGENTIAL HOT GAS ENTRIES FOR PRODUCTION OF NEGATIVE TINT RESIDUAL CARBON BLACK

John R. Casperson, and Paul D. Hann, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 22, 1982, Ser. No. 350,850

Int. Cl.³ B01J *10/00, 19/26;* C09C *1/48*

U.S. Cl. 422—151 **21 Claims**



1. A carbon black reactor comprising:

(a) a precombustion chamber defined by an upstream confining wall, a downstream confining wall substantially parallel thereto, and a cylindrical wall having a longitudinal axis wherein said cylindrical wall connects said upstream and downstream confining walls, wherein said upstream and downstream confining walls lie in planes which are skewed with respect to said longitudinal axis at an angle of 30 to 60 degrees;

(b) feedstock injection means for the introduction of at least one reactant through said upstream confining wall into said precombustion chamber;

(c) means for introducing combustion gases tangentially through said cylindrical wall into said precombustion chamber; and

(d) a pyrolytic carbon black-forming section operatively connected with said precombustion chamber, and in open communication with said precombustion chamber through said downstream confining wall.

4,447,402

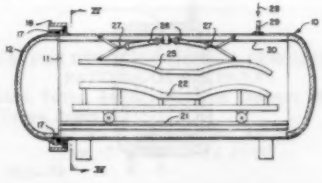
AUTOCLAVES

G. Robert Cox, Pittsburgh, Pa., assignor to Devine Manufacturing Company, Pittsburgh, Pa.

Filed May 27, 1982, Ser. No. 382,598

Int. Cl.³ B01J *3/04*

U.S. Cl. 422—174 **15 Claims**



1. An autoclave apparatus for raising the temperature of metal and like parts to be bonded and/or cured comprising a pressure vessel receiving parts to be bonded and/or cured, a removable cover on one end of said pressure vessel providing access thereto, means in said vessel for holding a product to be bonded and/or cured in fixed position, means for providing a pressure gas in said vessel at a selected pressure level and radiant heat means in the vessel directing bonding and/or curing heat directly onto the surface of the product at a rate sufficient to heat the product to the desired bonding and/or

curing temperature without substantially heating the pressure vessel and its parts.

4,447,403

METHOD FOR AUTOCLAVE OXIDATION OF ION SPECIES AQUEOUS SOLUTIONS

Laurence W. Bierman; Gary L. Long, and David Bortner, all of Pocatello, Id., assignors to J. R. Simplot Company, Boise, Id.

Filed Sep. 4, 1979, Ser. No. 72,304
Int. Cl.³ C01G *43/00*
U.S. Cl. 423—20 **16 Claims**

1. A process for controlling the corrosivity of wet process phosphoric acid solution comprising the steps of:

(a) flowing the acid solution into a controlled environment reaction vessel having a total volumetric capacity greater than the volume of the acid solution therein;

(b) flowing oxygen into said vessel in sufficient quantity to substantially oxidize said reduced metal ion species present in the acid solution;

(c) oxidizing the reduced metal ion species in the acid solution by an autoclave oxidation in said reaction vessel at a temperature selected from within a range of from about 80° F. to about 170° F., at a pressure selected from within a range of from about 100 psi to about 160 psi, and by dispersing the oxygen throughout the acid solution in said reaction vessel;

(d) said oxidizing and dispersing step being continued for a period of time less than about two minutes to effect substantial oxidation of said reduced metal ion species present in the acid solution; and

(e) removing the acid solution from the reaction vessel.

4,447,404

RECOVERY OF MOLYBDENUM FROM MOLYBDENUM DISULFIDE

Clarence D. Vanderpool, and Martin B. MacInnis, both of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 20, 1982, Ser. No. 451,120
Int. Cl.³ C01G *39/00*
U.S. Cl. 423—61 **1 Claim**

1. A process for producing ammonium molybdate from a molybdenum disulfide concentrate comprising contacting said concentrate with an aqueous solution of ammonium chloride and chlorine at suitable concentrations and for a sufficient period of time to solubilize molybdenum disulfide present in said concentrate as molybdate ions and adding ammonium hydroxide to said aqueous solution after said contacting to form a solution of ammonium molybdate.

4,447,405

REMOVAL OF BROMIDES FROM ARSENIC ACID SOLUTION

Byung K. Ahn, Pittsburgh, and Kenneth A. Morris, Irwin, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Aug. 26, 1982, Ser. No. 411,817
Int. Cl.³ C01B *29/00*
U.S. Cl. 423—88 **10 Claims**

1. A method for removing bromide from a solution containing same and a major proportion of H_3AsO_4 which comprises contacting said solution with an oxidant selected from H_2O_2, O_3 or Cr(VI) to convert bromide to bromine, and subjecting the resultant solution to a purge of air or inert gas to remove said bromine.

4,447,406

PROCESS FOR RECOVERING CESIUM FROM CESIUM ORE

Peter G. Mein, LaSalle, Ill., assignor to Carus Corporation, LaSalle, Ill.

Filed Jul. 12, 1983, Ser. No. 512,924
Int. Cl.³ C01G *45/12*
U.S. Cl. 423—198 **16 Claims**

1. A process for recovering cesium from a cesium-bearing mineral wherein the finely-divided mineral is extracted with aqueous hydrochloric acid (HCl) to obtain an aqueous acidic extract containing in solution cesium chloride (CsCl) together with rubidium chloride (RbCl), aluminum chloride ($AlCl_3$) and other metal chlorides selected from the group consisting of potassium chloride (KCl), sodium chloride (NaCl), iron chloride ($FeCl_3$), or mixtures thereof, wherein the improvement comprises

(a) increasing the pH of said aqueous acidic extract to a pH of 2.5 to 3.0 or higher;

(b) separating any precipitated metal hydroxide from the aqueous solution of CsCl;

(c) adding a water-soluble permanganate to said aqueous solution and selectively precipitating cesium permanganate ($CsMnO_4$) in the presence of other metal chlorides; and

(d) separating the precipitate from the residual solution to obtain $CsMnO_4$ of high purity.

4,447,407

PERFLUOROAMMONIUM SALTS FLUOROXENON ANIONS

Karl O. Christe, Calabasas, and William W. Wilson, Simi Valley, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 391,786, Jun. 24, 1983, Pat. No. 4,428,913. This application Oct. 11, 1983, Ser. No. 540,951
Int. Cl.³ C01B *23/00*
U.S. Cl. 423—262 **2 Claims**

1. $(NF_4)_2XeF_8$.

2. A method of preparing $(NF_4)_2XeF_8$ comprising the following steps in order:

(1) exposing NF_4XeF_7 to a blue 4880 Å laser light source until photolytic decomposition of NF_4XeF_7 occurs resulting in $(NF_4)_2XeF_8$ formation, and

(2) isolating the product $(NF_4)_2XeF_8$.

4,447,408

PHOSPHONITRILIC CHLORIDE POLYMERS

Hsueh M. Li, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 314,522, Oct. 26, 1981, Pat. No. 4,374,815. This application Dec. 7, 1982, Ser. No. 447,720
The portion of the term of this patent subsequent to Feb. 22, 2000, has been disclaimed.
Int. Cl.³ C01B *25/10*
U.S. Cl. 423—300 **21 Claims**

1. A process for producing linear phosphonitrilic chloride polymers from linear phosphonitrilic chloride oligomers of lower molecular weight which comprises:

(a) heating a mixture of linear phosphonitrilic chloride oligomer having an average degree of polymerization of at least 3 and an excess of ammonium chloride at a temperature in the range of about 130° to about 250° C. while concurrently removing hydrogen chloride and concurrently or subsequently removing cyclic phosphonitrilic chloride oligomer from the heated reaction mixture, said ammonium chloride having a particle size within the range of about 0.1 microns to about 210 microns such that, the Mean Value is within the range of about 1 micron to about 110 microns; and

(b) after the formation of cyclic phosphonitrilic chloride

oligomer has essentially ceased and after removal of the oligomer, heating the reaction mixture in an inert liquid solvent at a temperature in the range of about 130° to about 250° C. to increase the molecular weight of the dissolved linear phosphonitrilic chloride polymer.

4,447,409

PROCESS FOR THE PRODUCTION OF HYDROGEN AND CARBONYL SULFIDE FROM HYDROGEN SULFIDE AND CARBON MONOXIDE USING A METAL BORIDE, NITRIDE, CARBIDE AND/OR SILICIDE CATALYST

Michael F. McGuiggan, Shaker Heights, and Philip L. Kuch, Aurora, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 10, 1982, Ser. No. 448,580
Int. Cl.³ C01B *31/26, 1/03*
U.S. Cl. 423—416 **20 Claims**

1. A process for the production of hydrogen and carbonyl sulfide, the process comprising contacting gaseous hydrogen sulfide with gaseous carbon monoxide in the presence of a boride, nitride, carbide or silicide catalyst of the formula

$$M_{1-3}M'_{1-2} \quad (I)$$

wherein

M is at least one of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Fe and Co; and

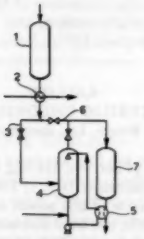
M' is at least one of B, N, C and Si.

4,447,410

PROCESS FOR THE CONVERSION OF CARBON MONOXIDE INTO HYDROGEN AND CARBON DIOXIDE

Giuseppe Giammarco, deceased, late of Palazzo Morolin, Italy, and by Paolo Giammarco, heir, San Marco 3242, Palazzo Morolin, Venezia, Italy

Continuation of Ser. No. 195,805, Oct. 10, 1980, abandoned. This application May 9, 1983, Ser. No. 490,737
Claims priority, application Italy, Oct. 11, 1979, 68990 A/79
Int. Cl.³ C01B *1/13*
U.S. Cl. 423—655 **5 Claims**



1. In a process for the production of hydrogen in a plant comprising a first unit defining a high temperature reaction stage in which combustible substances are reacted with steam at high temperature to provide a high temperature gas, a second unit including a low temperature conversion stage for the conversion of carbon monoxide present in the gas thus obtained in said first unit by means of reaction with steam and a unit for the removal of CO_2 and/or CO_2+H_2S from the gaseous reaction mixture thus obtained in which the steam necessary for the functioning of said units is supplied by a process boiler, the improvement comprising increasing the amount of steam present in the high temperature gas during the conversion reaction by heating a stream of water by means of the heat contained in the gaseous mixture at the outlet of said low temperature conversion stage, bringing the high temperature gas from the high temperature conversion stage into direct contact with said heated stream of water to convert the heat of said water thus heated and the sensitive heat contained in the gas contacted with said water to produce steam until the gas from the high temperature conversion stage cools down to the saturation temperature to provide a saturated gas, utilizing the heat of the high temperature gas prior to bringing the high temperature gas into contact with said heat stream of water to heat said saturated gas up to the temperature required for the functioning of the low temperature conversion stage and delivering said overheated gas to said low temperature conversion stage.

4,447,411

CONTROLLING UNDESIRED GROWTH OF MOLLUSKS

Christopher J. Langdon, Lewes, Del., assignor to University of Delaware, Newark, Del.

Filed Mar. 26, 1982, Ser. No. 362,211
Int. Cl.³ A61K *9/50*
U.S. Cl. 424—14 **3 Claims**

1. The method of controlling undesirable mollusks which comprises the steps of releasing in their feed waters a microencapsulated adductor muscle relaxant, and subjecting the mollusks to a biocide after the adductor muscle relaxant takes effect.

4,447,412

ENZYME-CONTAINING DIGESTIVE AID COMPOSITIONS

Gerald L. Bilton, 195 Scranton Ct., Zionsville, Ind. 46077

Filed Feb. 1, 1983, Ser. No. 462,995
Int. Cl.³ A61K *37/48, 9/42, 9/28*
U.S. Cl. 424—16 **11 Claims**

1. A composition adapted to reduce the symptoms of digestive dysfunction when ingested orally comprising:

(a) a pancreatic enzyme extract;

(b) a proteolytic enzyme of plant origin;

(c) a choleretic agent;

(d) a hydrochloric acid source; and

(e) pepsin,

wherein the pancreatic enzyme extract and the proteolytic plant enzyme are adhered to digestible beads, said enzyme-containing beads being further coated so as to maintain their integrity when placed in about 1.2 N aqueous hydrochloric acid for at least one hour, and said coated beads being sized so as to readily pass through the stomach, and said coated beads being mixed with granules comprising the choleretic agent, the hydrochloric acid source and pepsin.

4,447,413

DRIFT INFLUENCING COMPOSITION

Wayland J. Rippstein, Jr., Alvin, Tex., assignor to Aviation Chemical, Inc., Winnie, Tex.

Continuation-in-part of Ser. No. 147,721, May 8, 1980, abandoned. This application Jul. 17, 1981, Ser. No. 284,192
Int. Cl.³ A61K *31/74*
U.S. Cl. 424—78 **4 Claims**

1. An agricultural composition for restricting the drift of agricultural insecticides and other chemicals sprayed onto crops from an aircraft comprising an aqueous solution of:

(a) an agricultural insecticide or chemical in an agriculturally effective amount, and

(b) from about seventy (70) to about two hundred (200) p.p.m. of polyethylene oxide to water and to water and having a molecular weight of 300,000 to about 4,000,000 by weight.

4,447,414
CARNIVORE ANTHELMINTICS

John C. Gay, St. Joseph, Mo.; H. Dennis McCurdy, Merriam, and Wayne B. Rose, Overland Park, both of Kans., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Dec. 21, 1982, Ser. No. 451,990
Int. Cl.³ A61K *31/78, 31/495*
U.S. Cl. 424—81 16 Claims

1. An oral anthelmintic composition for carnivores comprising effective amounts of a compound which is primarily systemically active and a compound which is primarily active via direct contact with helminths in a carnivore gut, the compounds being carried in a vehicle which simultaneously provides systemic and direct contact availability of the compounds, the composition being in the form of an aqueous paste containing at least 50% by weight water.

10. An oral broad spectrum anthelmintic composition for dogs and cats comprising anthelmintically effective amounts of praziquantel and febantel in an aqueous, deaerated paste-like form and comprising at least 50% by weight water.

4,447,415
PLASMA-FREE MEDIUM FOR PLATELET STORAGE

Gail A. Rock, 270 Sandridge Rd., Rockcliffe Park, Canada (K1L 5A2), and George A. Adams, 543 Broadview Ave., Ottawa, Canada (K2A 2L3)

Filed Dec. 14, 1982, Ser. No. 449,762
Claims priority, application Canada, Nov. 1, 1982, 414583
Int. Cl.³ A61K *35/14*
U.S. Cl. 424—101 28 Claims

1. A method for the preparation of a blood platelet concentrate for administration to animals which comprises

centrifuging plasma to obtain a platelet pellet,

removing the supernatant plasma, and

resuspending the platelet pellet in a medium consisting essentially of: a balanced, physiologically compatible, saline solution; an anticoagulant; and one or more additives to enhance stability of the platelets selected from (a) nutrients to improve the storage life of the platelets, (b) reversible inhibitors for platelet activation, (c) substances to raise cyclic adenosine monophosphate levels which have reversible effects on platelets, and (d) buffering agents which are physiologically compatible.

18. A platelet concentrate composition for administration to animals comprising blood platelets suspended in a medium consisting essentially of:

a balanced, physiologically compatible, saline solution;

an anticoagulant; and

one or more additives to enhance stability of the platelets selected from (a) nutrients to improve the storage life of the platelets, (b) reversible inhibitors for platelet activation, (c) substances to raise cyclic adenosine monophosphate levels which have reversible effects on platelets, and (d) buffering agents which are physiologically compatible.

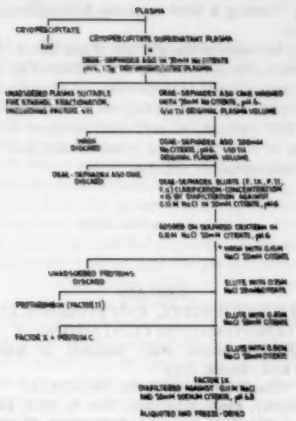
4,447,416
PLASMA PROTEIN CONCENTRATES OF REDUCED THROMBOGENICITY AND THEIR USE IN CLINICAL REPLACEMENT THERAPY

Doris Menache-Aronson, Bethesda; David P. Kosow, Derwood; Carolyn L. Orthner, Rockville, all of Md., and H. Evan Behre, Alexandria, Va., assignors to American National Red Cross, Washington, D.C.

Filed Apr. 28, 1982, Ser. No. 372,525
Int. Cl.³ A61K *35/16*
U.S. Cl. 424—101 12 Claims

1. An intermediate purified non-thrombogenic factor IX concentrate containing factor IX in therapeutic amounts up to a specific activity of about 17.6 (u/mg. protein), and containing factors II, VII, and X in non-thrombogenic amounts of less than about 1%, 0.5%, and 5% by specific activity of factor IX, respectively.

11. An intermediate purified non-thrombogenic factor X concentrate containing factor X in therapeutic amounts up to a specific activity of about 39.7 (u/mg. protein), and containing



factors II, VII, and IX in non-thrombogenic amounts of less than about 1%, 0.5%, and 15% by specific activity of factor X, respectively.

4,447,417
BASIC ALUMINIUM MAGNESIUM CARBONATE

Robert G. W. Spickett; Jacinto M. Mauri, and Jesus E. B. Puchades, all of Barcelona, Spain, assignors to Anphar S.A., Madrid, Spain

Filed Feb. 15, 1979, Ser. No. 12,435
Claims priority, application United Kingdom, Feb. 17, 1978, 6416/78
Int. Cl.³ A61K *33/10*
U.S. Cl. 424—156 5 Claims

1. A basic crystalline aluminium magnesium carbonate of the formula $Al_2Mg_6(OH)_{14}(CO_3)_2.4H_2O$.

2. A pharmaceutical antacid composition which comprises an effective amount of a basic crystalline aluminium magnesium carbonate of the formula $Al_2Mg_6(OH)_{14}(CO_3)_2.4H_2O$ in association with a pharmaceutically-acceptable carrier or diluent.

4,447,418
ANIMAL MEDICINE

Lilla A. Maddoux, 514 N. 5th, Sayre, Okla. 73662

Continuation of Ser. No. 241,451, Mar. 6, 1981, abandoned. This application Apr. 2, 1982, Ser. No. 364,761
Int. Cl.³ A61K *33/04, 35/60*
U.S. Cl. 424—165 7 Claims

6. An animal treating therapeutic composition formed by the process comprising the steps of:

(a) mixing equal volumes of

(i) fish oil containing esters of long chain polyunsaturated acids, said chains comprising 20 to 24 carbon atoms and 1 to 6 olefinic bonds, with

(ii) turpentine containing terpenes chosen from the group comprising α pinene, β pinene, Δ^3-carene, dipentene and terpinolene to form a first combination liquid composition, then

(b) adding to said first combination composition 93–98% sulfuric acid in the ratio of one fluid ounce of sulfuric acid to each portion of said first composition formed by one pint of fish oil and one pint of turpentine and thereby causing a reaction at 180–200 degrees F. between said esters and said terpenes and forming a homogeneous sec-

ond or reaction liquor, then cooling said reaction liquor to room temperature, then

(c) adding oleic acid to said cooled reaction liquor and thereby forming a third resultant homogeneous solution and then

(d) adding kerosene in the amount of one ounce of kerosene per portion of said first composition formed by one pint of fish oil and one pint of turpentine, said kerosene having a boiling point of 208 to 248 degrees C. and a sulfur content below 0.02 percent, to said third resultant solution and reacting it with said third resultant solution to form a fourth homogeneous solution.

4,447,419

THIAZOLE DERIVATIVE, AND PHARMACEUTICAL COMPOSITIONS CONTAINING IT

Giuseppe Quadro, Milan, Italy, assignor to Ausonia Farmaceutici s.r.l., Rome, Italy

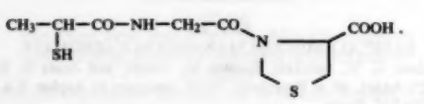
Filed Nov. 1, 1982, Ser. No. 438,283

Claims priority, application Italy, Nov. 5, 1981, 24866 A/81

Int. Cl.³ C07C *103/52;* **A61K** *37/02, 37/64*

U.S. Cl. 424—177 **2 Claims**

1. 3-[N-(2-mercapto-propionylamino-acetyl)]-tetrahydrothiazolyl-4-carboxylic acid, having formula (I)



(I)

4,447,420

FLUORENONE ESTERS OF PHOSPHORIC AND PHOSPHONIC ACIDS AS INSECTICIDES

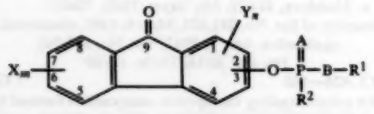
James T. Traxler, Evanston, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Sep. 30, 1982, Ser. No. 429,583

Int. Cl.³ A01N *57/12;* **C07F** *9/165*

U.S. Cl. 424—210 **9 Claims**

1.



wherein X and Y are each independently selected from the group consisting of halogen, lower alkyl, lower haloalkyl, nitro, lower alkylsulfinyl, lower alkylsulfonyl and cyano; m and n are integers from 0 to 3; m plus n is an integer from 0 to 3; R^1 is lower alkyl; R^2 is selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, amino, lower alkylamino and di(lower alkyl)amino; and A and B are each independently selected from the group consisting of oxygen and sulfur.

9. A method of controlling insects which compriese contacting said insects or the locus of said insect with an effective amount of an insecticidal composition comprising an inert carrier and as an essential active ingredient in a quantity toxic to insects, a compound of claim 1.

4,447,421

PROCESS FOR THE PREPARATION OF MEDICATED ANIMAL FEED SUPPLEMENT

Irving Klothen, Princeton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 239,740, Mar. 2, 1981, abandoned, which is a continuation-in-part of Ser. No. 147,805, May 8, 1980, abandoned. This application Apr. 8, 1983, Ser. No. 482,271

Int. Cl.³ A61U *31/35, 31/63, 31/65, 31/625*

U.S. Cl. 424—227 **12 Claims**

1. In a process for preparing medicated animal feeds, feed additives, feed supplements or feed premixes, the improvement comprising

using in the process a tetracycline antibiotic, a sulfa drug, penicillin, monensin, tylosin or lasalocid or a mixture of the drugs by either

(a) compacting the drug or mixture of drugs or

(b) compacting a blend of the drug or mixture of drugs blended with a compressible and pharmaceutically acceptable inert diluent or diluent mixture with sufficient force to obtain a

(1) compacted cdrug

(2) compacted mixture of drugs

(3) compacted blend of drug and diluent or diluents or

(4) compacted blend of a mixture of drugs and a diluent or diluents

of at least about 10 kg to 30 kg hardness on a Stokes hardness tester and of a particle size range of 10 to 150 mesh to prevent excessive build-up, deposition, retention and dusting of the drug or mixture of drugs in the process.

4,447,422

PENICILLINS AND COMPOSITIONS CONTAINING THEM

Andrew W. Taylor, Reigate, and Richard G. Adams, Woking, both of England, assignors to Beecham Group p.l.c., England

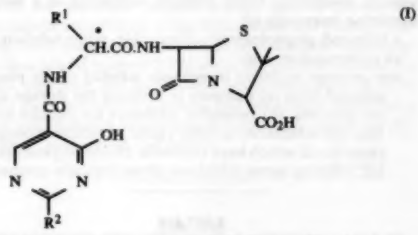
Filed Jun. 7, 1982, Ser. No. 385,805

Claims priority, application United Kingdom, Jun. 16, 1981, 8118552

Int. Cl.³ H01K *31/505;* **C09D** *499/10*

U.S. Cl. 424—229 **21 Claims**

1. A compound of the formula (I):



(I)

a pharmaceutically acceptable salt thereof or an in-vivo hydrolyzable ester thereof, wherein R^1 is phenyl, 4-hydroxyphenyl, 3,4-dihydroxyphenyl, 3,4-diacetoxyphenyl or a 5- or 6-membered heterocyclic ring containing up to three heteroatoms selected from the group consisting of oxygen, sulphur and nitrogen, said ring being unsubstituted or substituted by hydroxy, amino, halo, or alkoxy of 1 to 6 carbon atoms; and R^2 is a sub-group of the formula (A):

(A)

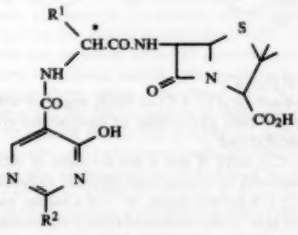
wherein R^3 is alkyl of 1 to 10 carbon atoms unsubstituted or substituted by up to 3 substituents selected from the group consisting of halo, carboxy, alkoxycarbonyl of 1 to 6 carbon atoms in the alkoxy moiety, carbamoyl, phenyl or naphthyl unsubstituted or substituted by up to 5 substituents selected

from the group consisting of halo, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms, hydroxy, amino, sulphonamido, carboxy, alkoxycarbonyl of 1 to 6 carbon atoms in the alkoxy moiety and alkoxycarbonylalkyl of 1 to 6 carbon atoms in the alkoxy moiety and the alkyl moiety; or cycloalkyl of 3 to 7 carbon atoms; or (B):

$$-NH-CO-R^4 \quad (B)$$

wherein R^4 is phenyl or naphthyl unsubstituted or substituted by up to 5 substituents selected from the group consisting of halo, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms, hydroxy, amino, sulphonamido, carboxy, alkoxycarbonyl of 1 to 6 carbon atoms in the alkoxy moiety and alkoxycarbonylalkyl of 1 to 6 carbon atoms in the alkoxy moiety and the alkyl moiety; alkyl of 1 to 10 carbon atoms unsubstituted or substituted by up to 3 substituents selected from the group consisting of halo, carboxy, alkoxycarbonyl of 1 to 6 carbon atoms in the alkoxy moiety, carbamoyl, phenyl or naphthyl unsubstituted or substituted by up to 5 substituents selected from the group consisting of halo, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms, hydroxy, amino, sulphonamido, carboxy, alkoxycarbonyl of 1 to 6 carbon atoms in the alkoxy moiety and alkoxycarbonylalkyl of 1 to 6 carbon atoms in the alkoxy moiety and the alkyl moiety; or alkyloxy of 1 to 6 carbon atoms unsubstituted or substituted by phenyl or naphthyl unsubstituted or substituted by up to 5 substituents selected from the group consisting of halo, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms, hydroxy, amino, sulphonamido, carboxy, alkoxycarbonyl of 1 to 6 carbon atoms in the alkoxy moiety and alkoxycarbonylalkyl of 1 to 6 carbon atoms in the alkoxy moiety and the alkyl moiety.

14. A pharmaceutical composition useful for treating bacterial infections in humans and animals which comprises an antibacterially effective amount of a compound of the formula (I)



(I)

a pharmaceutically acceptable salt thereof or a pharmaceutically acceptable in-vivo hydrolyzable ester thereof, wherein R^1 is phenyl, 4-hydroxyphenyl, 3,4-dihydroxyphenyl, 3,4-diacetoxyphenyl or a 5- or 6-membered heterocyclic ring containing up to three heteroatoms selected from the group consisting of oxygen, sulphur and nitrogen, said ring being unsubstituted or substituted by hydroxy, amino, halo, or alkoxy of 1 to 6 carbon atoms; and R^2 is a sub-group of the formula (A):

$$-NH-R^3 \quad (A)$$

wherein R^3 is alkyl of 1 to 10 carbon atoms unsubstituted or substituted by up to 3 substituents selected from the group consisting of halo, carboxy, alkoxycarbonyl of 1 to 6 carbon atoms in the alkoxy moiety, carbamoyl, phenyl or naphthyl unsubstituted or substituted by up to 5 substituents selected from the group consisting of halo, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms, hydroxy, amino, sulphonamido, carboxy, alkoxycarbonyl of 1 to 6 carbon atoms in the alkoxy moiety and alkoxycarbonylalkyl of 1 to 6 carbon atoms in the alkoxy moiety and the alkyl moiety; or cycloalkyl of 3 to 7 carbon atoms; or (B):

$$-NH-CO-R^4 \quad (B)$$

wherein R^4 is phenyl or naphthyl unsubstituted or substituted by up to 5 substituents selected from the group consisting of halo, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms, hydroxy, amino, sulphonamido, carboxy, alkoxycarbonyl of 1 to 6 carbon atoms in the alkoxy moiety and alkoxycarbonylalkyl of 1 to 6 carbon atoms in the alkoxy moiety and the alkyl moiety; alkyl of 1 to 10 carbon atoms unsubstituted or substituted by up to 3 substituents selected from the group consisting of halo, carboxy, alkoxycarbonyl of 1 to 6 carbon atoms in the alkoxy moiety, carbamoyl, phenyl or naphthyl unsubstituted or substituted by up to 5 substituents selected from the group consisting of halo, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms, hydroxy, amino, sulphonamido, carboxy, alkoxycarbonyl of 1 to 6 carbon atoms in the alkoxy moiety and alkoxycarbonylalkyl of 1 to 6 carbon atoms in the alkoxy moiety and the alkyl moiety; or alkyloxy of 1 to 6 carbon atoms unsubstituted or substituted by phenyl or naphthyl unsubstituted or substituted by up to 5 substituents selected from the group consisting of halo, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms, hydroxy, amino, sulphonamido, carboxy, alkoxycarbonyl of 1 to 6 carbon atoms in the alkoxy moiety and alkoxycarbonylalkyl of 1 to 6 carbon atoms in the alkoxy moiety and the alkyl moiety, in combination with a pharmaceutically acceptable carrier.

4,447,423

PEDICULICIDE COMPOSITION AND METHOD OF USE

Lester J. Workman, P.O. Box 5547, Sarasota, Fla. 34277

Continuation-in-part of Ser. No. 249,696, Mar. 31, 1981, Pat. No. 4,374,853. This application Jan. 18, 1983, Ser. No. 459,035

Int. Cl.³ A61K *31/61*

U.S. Cl. 424—234 **6 Claims**

1. A method of killing lice on warm-blooded animals comprising the steps of:

(a) applying to said animal a pediculicidely-effective amount of a composition consisting essentially of an alcohol solution of from 10 to about 25 weight percent benzyl salicylate and from 10 up to about 50 weight percent of at least one compatible, pediculicidely-effective surface active wetting agent incorporated therein, the balance of the solution being said alcohol;

(b) allowing the thus applied composition to remain in contact with the infested area for a period of time sufficient to kil! the lice contained therein, and thereafter

(c) removing the composition and killed lice.

4,447,424

STEROID DERIVATIVES

Jean G. Teutsch, Pantin; Germain Costerousse, Saint-Maurice; Daniel Philibert, La Varenne Saint Hilaire, and Roger Deraedt, Pavillons sous Bois, all of France, assignors to Roussel Uclaf, Paris, France

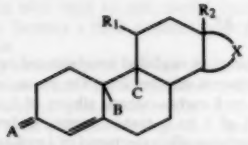
Continuation-in-part of Ser. No. 338,077, Jan. 9, 1982, Pat. No. 4,386,085. This application Jun. 10, 1982, Ser. No. 386,967

Claims priority, application France, Jan. 9, 1981, 81 00272

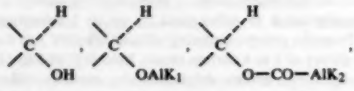
Int. Cl.³ A01N *45/00;* **A61K** *31/56*

U.S. Cl. 424—238 **36 Claims**

1. An antiprogestomimetic composition comprising an antiprogestomimetically effective amount of at least one compound selected from the group consisting of 19-nor steroids and 19-nor-D-homo-steroids of the formula

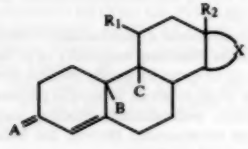


wherein R_1 is an organic radical of 1 to 18 carbon atoms containing at least one atom selected from the group consisting of nitrogen, phosphorous and silicon with the atom immediately adjacent to the 11-carbon atom being carbon, R_2 is a hydrocarbon of 1 to 8 carbon atoms, X is selected from the group consisting of a pentagonal ring and a hexagonal ring optionally substituted and optionally containing a double bond, B and C together form a double bond or an epoxy group, the ring C=A group at position 3 is selected from the group consisting of C=O, ketal,

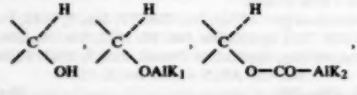


>C=NOH, >C=NOAlK$_3$ and CH_2, AlK$_1$, ALK$_2$ and AlK$_3$ are selected from the group consisting of alkyl of 1 to 8 carbon atoms and aralkyl of 7 to 15 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts and an inert carrier.

15. A method of inducing menses in warm-blooded animals comprising administering to warm-blooded animals, when progesterone plays a physiologically essential role, an antiprogestomimetically effective amount of at least one compound selected from the group consisting of 19-nor steroids and 19-nor-D-homo-steroids of the formula



wherein R_1 is an organic radical of 1 to 18 carbon atoms containing at least one atom selected from the group consisting of nitrogen, phosphorous and silicon with the atom immediately adjacent to the 11-carbon atom being carbon, R_2 is a hydrocarbon of 1 to 8 carbon atoms, X is selected from the group consisting of a pentagonal ring and a hexagonal ring optionally substituted and optionally containing a double bond, B and C together form a double bond or an epoxy group, the ring C=A group at position 3 is selected from the group consisting of C=O, ketal,



>C=NOH, >C=NOAlK$_3$ and CH_2, AlK$_1$, AlK$_2$ and AlK$_3$ are selected from the group consisting of alkyl of 1 to 8 carbon atoms and aralkyl of 7 to 15 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

4,447,425

MONO- AND BISQUATERNARY AMMONIUM DERIVATIVES OF 2β,16β-DI-AMINO-5α-ANDROSTANE DERIVATIVES AND PHARMACEUTICAL PREPARATIONS CONTAINING SAME

Ian C. Carlyle, Hamilton; David S. Savage, Glasgow, and Thomas Sleigh, Wishaw, all of Scotland, assignors to Akzo N.V., Arnhem, Netherlands

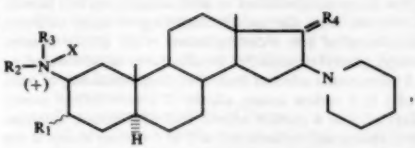
Filed Jun. 9, 1982, Ser. No. 386,756

Claims priority, application United Kingdom, Jun. 15, 1981, 8118365

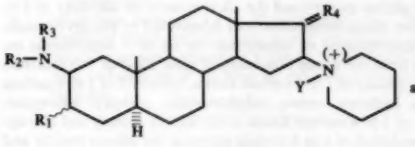
Int. Cl.^{3} **A61K** *31/58*; **C07J** *43/00*

U.S. Cl. 424—241 **18 Claims**

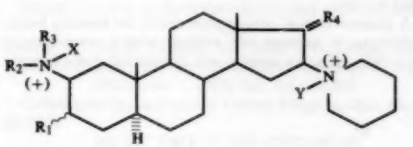
1. Mono- and bisquaternary ammonium derivatives of 2β,16β-di-amino-5α-androstanes having the formula:



.2(−)



.2(−) and



.2(−)

wherein:

R_1=H or alkyl (1–4 C);

R_2 and R_3 each are alkyl (1–4 C) or form, together with the N-atom, a piperidino, pyrrolidino or morpholino group;

R_4=O or H(βOR$_5$) and

R_5=H or (C_1–C_{18}) acyl, X and Y are the same or different and are a saturated or unsaturated aliphatic hydrocarbon group having 1–4 carbon atoms, $Z^{(-)}$ is a halide, and the acid addition salts of the monoquaternary compounds.

8. A pharmaceutical composition having neuromuscular blocking activity comprising a neuromuscular blocking effective amount of one or more compounds of claim 1 and a pharmaceutically acceptable carrier.

4,447,426

STEROID MONOHYDRATES, FORMULATIONS CONTAINING SAME AND METHOD

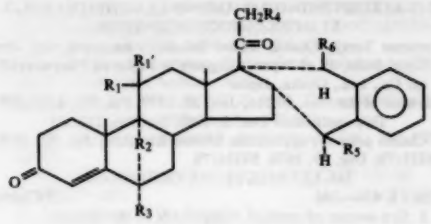
Yu-Chang J. Wang, North Brunswick; Friedrich Dürsch, Hopewell; Richard L. O'Laughlin, North Brunswick, and Thaddeus Prusik, Roosevelt, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 340,127, Jan. 18, 1982, Pat. No. 4,391,755. This application Dec. 27, 1982, Ser. No. 453,562

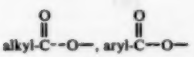
Int. Cl.^{3} **A61K** *31/56*

U.S. Cl. 424—243 **12 Claims**

1. The steroid monohydrate having an average particle size of less than about 20 microns having the structure



and the 1,2-dehydro derivative thereof, wherein R_1 is chlorine, fluorine or hydroxy and R'_1 is hydrogen or R_1 and R'_1 together are =O; R_2 is hydrogen or halogen; R_3 is hydrogen, methyl or fluorine, R_4 is hydrogen, hydroxy,



or halogen; and R_5 and R_6 are the same or different and are hydrogen, alkyl, alkylthio, alkoxy, carboalkoxy, formyl,

hydroxy, halogen, phenyl or cyano, with the proviso that when R_5 and R_6 are different, one of R_5 and R_6 is hydrogen, which monohydrate is in the form of a particulate material having a stable average particle size of less than about 20 microns, prepared by the process which includes the steps of micronizing the steroid in anhydrous form to reduce average particle size to below about 20 microns, introducing the micronized anhydrous steroid into water to form a suspension containing from about 5 to about 20% by weight steroid, allowing the steroid to remain in suspension for at least 0.1 hour to hydrate the steroid to form the corresponding monohydrate and cause crystal growth, and reducing the average particle size of the crystals of hydrated steroid suspended in water to below about 20 microns to form particles of steroid monohydrate having a relatively stable crystal size.

4,447,427

METHOD FOR TREATING BACTERIAL INFECTIONS WITH 2-ACETYL- AND 2-PROPIONYLPYRIDINE THIOSEMICARBAZONES

Daniel L. Klayman, Chevy Chase; John P. Scovill, Rockville; Joseph F. Bartosevich; Carl J. Mason, both of Silver Spring, all of Md., and T. Scott Griffin, Orange, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

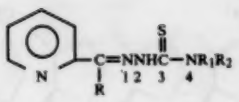
Continuation of Ser. No. 4,247, Jan. 4, 1979, Pat. No. 4,317,776. This application Oct. 14, 1981, Ser. No. 311,369

Int. Cl.[3] **A61K** *31/33, 31/495, 31/47, 31/435*

U.S. Cl. 424—244 **51 Claims**

1. A method for treating an animal which has a bacterial infection selected from the group consisting of Group D Enterococcus, and *Neisseria meningitidis* by administering to said animal a therapeutically-effective amount of:

(a) a pyridine thiosemicarbazone derivative selected from the compounds represented by the formula:



or

(b) a pharmaceutically-acceptable acid addition salt thereof wherein

R is methyl or ethyl; and

R_1 is alkyl having 1 to 12 carbon atoms; cycloalkyl having 3 to 10 carbon atoms; substituted alkyl (wherein the substituent is amino, alkylamino, dialkylamino, cycloalkyl, hydroxy, COO alkyl, phenyl, or pyridyl); alkenyl having 2 to 6 carbon atoms; alkynyl having 3 to 6 carbon atoms; substituted benzyl (wherein the substituent is methyl or phenyl on the alpha carbon atom, or the substituent is alkyl, dialkyl, halo, dihalo, or alkoxy on the phenyl ring); adamantyl; phenyl; naphthyl; substituted phenyl or substituted naphthyl (wherein the ring is mono-, di-, or trisubstituted and the substituents are alkyl, halo, alkoxy, hydroxy, phenoxy, trifluoromethyl, dialkylamino, dialkylaminoalkyl, or COO alkyl); or pyridyl, and

R_2 is hydrogen or is selected from the group of radicals listed above for R_1, in which case R_1 and R_2 may be the same or different; or

R_1 and R_2 are taken together with the nitrogen atom to which they are attached to form a heterocyclic ring selected from the group consisting of:

(1) alkylenimino having 3 to 13 carbon atoms;

(2) alkylenimino, having 3 to 13 carbon atoms, which may contain one double bond and/or is mono- or disubstituted with alkyl, hydroxy, phenyl, or benzyl;

(3) alkylenimino, having 3 to 13 carbon atoms, which is either bridged by an ankylene group, or is fused to a phenyl ring, or is attached by a spiro linkage to an ethylene ketal group; and

(4) homopiperazinyl; homopiperazinyl substituted with alkyl; piperazinyl; or piperazinyl substituted with alkyl, dialkyl, phenyl, COO alkyl, trifluoromethylphenyl, halophenyl, benzyl, or pyridyl; provided that: when R_2 is hydrogen, then R_1 cannot be ethyl, isopropyl, or monochlorophenyl.

4,447,428

PROSTANOID COMPOUNDS AND PHARMACEUTICAL COMPOSITIONS

Eric W. Collington, Welwyn; Harry Finch, Hitchin, and Roger F. Newton, Melbourn, all of England, assignors to Glaxo Group Limited, England

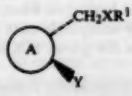
Division of Ser. No. 440,622, Nov. 10, 1982, Pat. No. 4,409,213, which is a continuation of Ser. No. 232,363, Feb. 6, 1981, abandoned, which is a division of Ser. No. 56,416, Jul. 10, 1979, Pat. No. 4,265,891. This application Jul. 15, 1983, Ser. No. 514,261

Claims priority, application United Kingdom, Jul. 11, 1978, 29403/78

Int. Cl.[3] **A61K** *31/55, 31/557;* **C07D** *223/00, 295/14*

U.S. Cl. 424—244 **12 Claims**

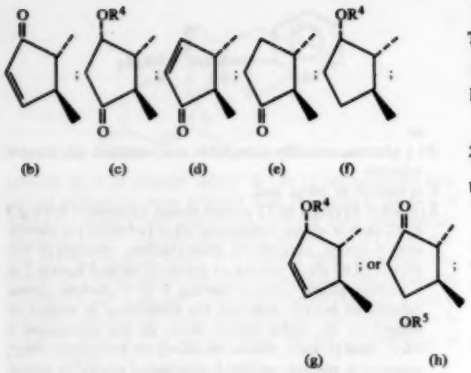
1. Prostanoids of the general formula (1)



(1)

in which

A represents



(b) (c) (d) (e) (f) (g) (h)

X is cis or trans —CH=CH— or —$(CH_2)_2$—;

R^1 is straight or branched C_{1-7} alkyl bearing as a terminal substituent —$COOR^{10}$ where R^{10} is a hydrogen atom, C_{1-6} alkyl or C_{7-10} phenalkyl;

Y represents:

(i) —NR^2R^3, where R^2 and R^3 are the same or different and represent hydrogen atom, phenalkyl having a C_{1-7} alkyl portion, or C_{1-10} alkyl (said C_{1-7} alkyl portion or said C_{1-10} alkyl being optionally substituted by one or more substituents —OR^7 or NR^8R^9; wherein R^7 represents hydrogen atom, C_{1-7} alkyl, phenyl or phenalkyl having a C_{1-4} alkyl portion; and wherein R^8 and R^9 are the same or different and represent hydrogen atom or C_{1-4} alkyl, or where —NR^8R^9 is a saturated heterocyclic amino group as defined below for Y); any phenyl group in R^2 or R^3 being optionally substituted by one or more C_{1-4} alkyl or trifluoromethyl groups; always provided that the total numbers of carbon atoms in the group —NR^2R^3 does not exceed 15; or

(ii) a saturated heterocyclic amino group selected from the group consisting of pyrrolidino, piperidino, morpholino, piperazino, thiamorpholino, 1-dioxothiamorpholino, homomorpholino, hexamethyleneimino, piperazino substituted at the second nitrogen atom by C_{1-7} alkyl or phenalkyl having a C_{1-4} alkyl portion, and piperidino which contains in the ring the group >$C(OH)R^6$ (where R^6 is a hydrogen atom, C_{1-7} alkyl, phenyl, or phenalkyl having a C_{1-4} alkyl portion) and any of said groups substituted on the ring by one or more C_{1-4} alkyl groups;

R^4 is a hydrogen atom, C_{1-6} alkyl (optionally interrupted by one or two oxygen atoms), C_{3-6} alkenyl, C_{2-4} alkanoyl, phenalkanoyl having a C_{2-4} alkanoyl portion, phenyl or aralkyl selected from the group consisting of benzyhydryl, naphthyl (C_{1-3}) alkyl and phen (C_{1-3}) alkyl and any one of said aryl groups substituted by one or more halogen, hydroxy C_{1-6} alkyl, C_{1-6} alkoxy, C_{1-4} hydroxyalkoxy, trifluoromethyl, cyano, phenyl, phenoxy, C_{5-7} cycloalkyl, phenalkoxy, dimethylaminomethyl, carboxamido (—$CONH_2$), thiocarboxamido (—$CSNH_2$), C_{1-4} alkanoyl or —NR^8R^9 groups as defined above);

R^5 is as defined above for R^4, excluding phenyl and with the proviso that R^5 is not hydrogen when A is the group (h);

and the physiologically acceptable salts thereof;

provided that when A is the group (C), then Y is the group—NR^2R^3.

12. A pharmaceutical composition comprising a bronchodilator or blood platelet aggregation-inhibiting effective amount of a compound as claimed in claim **1** and one or more pharmaceutical carriers.

4,447,429

7-[2-ALKOXYIMINO-2-(5-AMINO-1,2,4-THIADIAZOL-3-YL)ACETAMIDO]-3-CEPHEMS

Tsutomu Teraji, Osaka; Kazuo Sakane, Amagasaki, and Jiro Goto, Suita, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

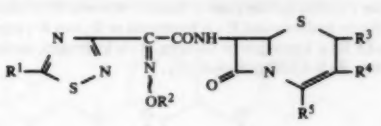
Division of Ser. No. 50,216, Jun. 20, 1979, Pat. No. 4,268,509. This application Dec. 5, 1980, Ser. No. 213,351

Claims priority, application United Kingdom, Jul. 10, 1978, 29357/78; Dec. 29, 1978, 50334/78

Int. Cl.[3] **A61K** *31/545;* **C07D** *501/34*

U.S. Cl. 424—246 **29 Claims**

1. Syn isomer of cephem compounds of the formula:



wherein

R^1 is amino or a protected amino,

R^2 is lower alkyl,

R^3 is hydrogen or lower alkyl,

R^4 is hydrogen, acyloxy(lower)alkyl or, acylthio(lower)alkyl and

R^5 is carboxy or a protected carboxy, and pharmaceutically acceptable salt thereof.

29. A pharmaceutical antibacterial composition comprising an effective amount of a compound of claim **1** or pharmaceutically acceptable salt thereof in association with a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

4,447,430

CEPHEM COMPOUNDS

Takao Takaya, Kawanishi; Hisashi Takasugi, Kohamanishi; Kiyoshi Tsuji, Osaka, and Toshiyuki Chiba, Nara, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

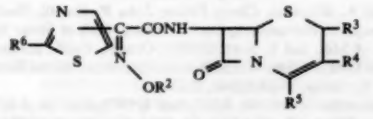
Division of Ser. No. 886,340, Mar. 14, 1978. This application Sep. 15, 1981, Ser. No. 302,682

Claims priority, application United Kingdom, Mar. 14, 1977, 10699/77; Jul. 12, 1977, 29245/77; Oct. 11, 1977, 42315/77; Jan. 3, 1978, 75/78

Int. Cl.[3] **C07D** *501/56;* **A61K** *31/545*

U.S. Cl. 424—246 **9 Claims**

1. A syn compound of the formula:



wherein

R^2 is hydrogen or aliphatic hydrocarbon which may be substituted with halogen, carboxy or esterified carboxy,

R^3 and R^4 are each lower alkyl,

R^5 is carboxy or carboxy modified to a group from which carboxy may be regenerated, and

R^6 is amino or protected amino, and pharmaceutically acceptable salt thereof.

4,447,431
TRI-SUBSTITUTED IMIDAZOLE DERIVATIVES, PHARMACEUTICAL PREPARATIONS CONTAINING THEM, AND THEIR USE

Alfred Sallmann, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

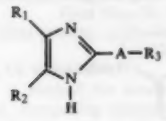
Division of Ser. No. 285,231, Jul. 20, 1981. This application Sep. 28, 1982, Ser. No. 425,603

Claims priority, application Switzerland, Jul. 25, 1980, 5715/80

Int. Cl.³ A61K *31/415, 31/44, 31/535;* **C07D** *401/04*

U.S. Cl. 424—246 **17 Claims**

1. A compound of the formula I



in which

one of the radicals R_1 and R_2 represent pyrrolyl, furyl, thienyl, pyridyl, 1-oxidopyridyl or pyrimidyl each of which are unsubstituted or substituted by halogen, lower alkyl, hydroxy, lower alkoxy, and/or lower alkanoyloxy,

and the other of the radicals R_1 and R_2 represents phenyl, pyrrolyl, furyl, thienyl, pyridyl, 1-oxidopyridyl or pyrimidyl each of which is unsubstituted or substituted by halogen, lower alkyl, hydroxy, lower alkoxy and/or lower alkanoyloxy;

A represents lower alkylene, lower alkylidene, lower alkenylene, lower alkenylidene, cycloalkylene, cycloalkylidene or cycloalkyl-lower alkylidene; and

R_3 represents carboxy, carboxy esterified by a lower alkanol, by a 3- to 8-membered cycloalkanol, by phenol, by a hydroxypyridine or by a substituted phenol or substituted hydroxypyridine, or represents carbamoyl or carbamoyl mono-substituted by hydroxy, by amino, by phenyl or by substituted phenyl, or represents carbamoyl mono- or di-substituted by lower alkyl or carbamoyl di-substituted by 4- to 7-membered alkylene or 3-aza-, 3-lower alkyl-aza-, 3-oxa- or 3-thiaalkylene, wherein said lower alkanol and said cycloalkanol can be unsubstituted or substituted by hydroxy, mercapto, optionally substituted phenyl, lower alkoxy, phenyl-lower alkoxy optionally substituted in the phenyl moiety, lower alkylthio, phenyl-lower alkylthio optionally substituted in the phenyl moiety, hydroxy-lower alkoxy, lower alkoxy-lower alkoxy, phenyl-lower alkoxy-lower alkoxy optionally substituted in the phenyl moiety, carboxy-lower alkoxy, lower alkoxycarbonyl-lower alkoxy, or lower alkoxycarbonyl-lower alkoxy containing optionally substituted phenyl, or lower alkanoyloxy, and wherein substituted phenyl, phenol or hydroxypyridine can each be substituted by lower alkyl, lower alkoxy, halogen and/or trifluoromethyl, their isomers and salts thereof.

17. A method for the treatment of inflammatory dermatoses and/or herpes infections comprising administering externally an antiphlogistically and/or anti-herpes effective amount of a compound as claimd in claim 1.

4,447,432
AZINO RIFAMYCINS

Giovanni Franceschi; Leonardo Marsili; Aurora Sanfilippo, all of Milan, and Sergio Vioglio, Cusano Milanino, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

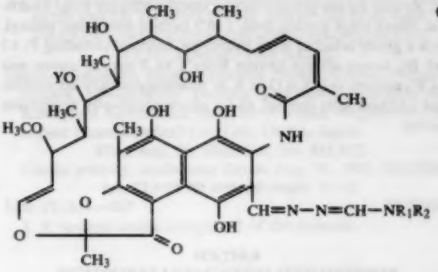
Filed Sep. 29, 1982, Ser. No. 427,467

Claims priority, application United Kingdom, Nov. 17, 1981, 8134549

Int. Cl.³ A61K *31/395;* **C07D** *498/08*

U.S. Cl. 424—248.54 **5 Claims**

1. A rifamycin having the formula (I)



(I)

wherein Y is a hydrogen atom or an acetyl group; R_1 is a linear or branched alkyl group having about 1 to 7 carbon atoms or an alkenyl group having about 3 or 4 carbon atoms; R_2 is a linear or branched alkyl group having about 1 to 7 carbon atoms a chloroalkyl group having about 2 to 4 carbon atoms, an alkenyl group having about 3 or 4 carbon atoms, a cycloalkyl group having about 3 to 7 carbon atoms in the ring, a cycloalkyl alkyl group having about 3 to 6 carbon atoms in the ring, a phenyl group, an unsubstituted aralkyl group having about 7 or 8 carbon atoms or an aralkyl group having about 7 or 8 carbon atoms being substituted by 1 halogen atom in the aryl group; or R_1 and R_2 along with the nitrogen atom to which they are bonded form a cyclic moiety, said moiety being pyrrolidinyl, piperidinyl, hexahydroazepinyl or heptahydroazocinyl, each of which are unsubstituted or substituted with 1 or 2 methyl radicals, 4-alkyl-1-piperazinyl, morpholinyl or 1, 2, 3, 4-tetrahydroisoquinolinyl.

4,447,433
DIPHENYLBUTYL-PIPERAZINECARBOXAMIDES TO TREAT PAIN

Anders K. K. Björk, Bjärred; Knut G. Olsson, Malmö ; Aina L. Abramo, Bjärred, and Erik G. Christensson, Lund, all of Sweden, assignors to AB Ferrosan, Malmo, Sweden

Division of Ser. No. 227,690, Jan. 23, 1981, Pat. No. 4,385,057, which is a continuation-in-part of Ser. No. 86,068, Oct. 18, 1979, Pat. No. 4,308,387. This application Sep. 15, 1982, Ser. No. 418,685

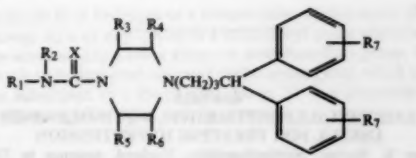
Claims priority, application Sweden, Oct. 20, 1978, 7810971

The portion of the term of this patent subsequent to May 24, 2000, has been disclaimed.

Int. Cl.³ A61K *31/495*

U.S. Cl. 424—250 **3 Claims**

1. A pharmaceutical composition for treatment of pain and for treatment of arrhythmia which comprises a pharmaceutically effective amount of a compound of formula I



(I)

wherein R_1 and R_2 are groups independently selected from the group of hydrogen, alkyl straight or branched chains having from 1 to 10 carbon atoms, cycloalkyl having from 3 to 8 carbon atoms, aralkyl having from 7 to 9 carbon atoms, alkenyl having from 2 to 10 carbon atoms, phenyl unsubstituted or substituted by one to three substituents selected from halogen, including F, Cl and Br, lower alkyl having from 1 to 5 carbon atoms, lower alkoxy having from 1 to 5 carbon atoms, amine unsubstituted or substituted by one or two lower alkyl groups

having from 1 to 5 carbon atoms, —CF_3 and —CN groups, R_3, R_4, R_5 and R_6 are groups independently selected from hydrogen, lower alkyl having from 1 to 3 carbon atoms and phenyl, R_7 is a group selected from hydrogen, halogen including F, Cl and Br, lower alkoxy having from 1 to 3 carbon atoms and —CF_3 groups, and X is O or S, or pharmaceutically acceptable acid addition salts thereof, and a pharmaceutically acceptable carrier.

4,447,434

SUBSTITUTED DIBENZODIAZEPINONES

Günter Trummlitz, Warthausen; Wolfhard Engel, Biberach; Wolfgang Eberlein, Biberach; Günther Schmidt, Biberach, all of Fed. Rep. of Germany; Rudolf Hammer, Milan, and Piero del Soldato, Monza, both of Italy, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

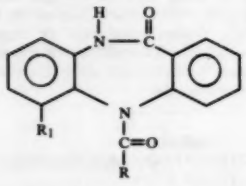
Filed Jan. 31, 1983, Ser. No. 462,149

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1982, 3204157

Int. Cl.³ C07D *403/06*; A61K *31/55*

U.S. Cl. 424—256 **11 Claims**

1. A compound of the formula



(I)

wherein R_1 is hydrogen or chlorine and R is (1-methyl-4-piperidinyl)-methyl, (1-methyl-1,2,5,6-tetrahydro-4-pyridinyl)-methyl, 1-methyl-1,2,5,6-tetrahydro-4-pyridinyl, (1-methyl-4-piperidinylidene)-methyl, (2,3-dehydro-8-methyl-8-azabicyclo[3,2,1]oct-3-yl)-methyl, (8-methyl-8-azabicyclo[3,2,1]oct]-3-ylidene)-methyl or an endo- or exo-(8-methyl-8-azabicyclo[3,2,1]oct-3-yl)-methyl, each being optionally substituted by one or two further methyls on the heterocyclic ring, a diastereomer or enantiomer thereof, or a non-toxic, pharmaceutically acceptable acid addition salt thereof.

7. A method of inhibiting ulcers in warm-blooded animals comprising administering to warm-blooded animals an antiulcergenically effective amount of at least one compound of claim **1**.

4,447,435

3-METHYLSULFONYLMETHYL-4-QUINOLINONES USEFUL FOR TREATING HYPERTENSION

Roy V. Davies, Nottinghamshire, England, assignor to The Boots Company PLC, Nottingham, England

Filed Sep. 21, 1981, Ser. No. 304,165

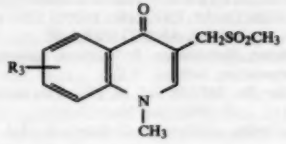
Claims priority, application United Kingdom, Sep. 26, 1980, 8031106; Sep. 26, 1980, 8031162; Jun. 19, 1981, 8118879; Jun. 19, 1981, 8119062

The portion of the term of this patent subsequent to Apr. 10, 2001, has been disclaimed.

Int. Cl.³ A61K *31/47*; C07D *215/22*

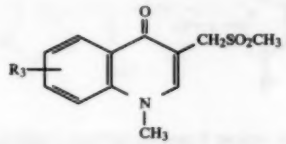
U.S. Cl. 424—258 **23 Claims**

1. Compounds of the general formula



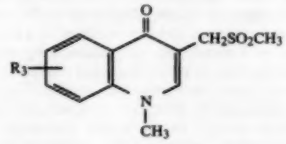
wherein R_3 is hydrogen, 7-chloro, 7-fluoro, 7-trifluoromethyl, 7-methyl or 6-fluoro.

8. Therapeutic compositions which comprise a antihypertensive effective amount of a quinolone of the general formula



wherein R_3 is hydrogen, 7-chloro, 7-fluoro, 7-trifluoromethyl, 7-methyl or 6-fluoro, together with a pharmaceutically acceptable carrier.

16. A method of treating hypertension in a hypertensive mammal which comprises administering to the hypertensive mammal a therapeutically effective amount of a quinolone of the general formula



wherein R_3 is hydrogen, 7-chloro, 7-fluoro, 7-trifluoromethyl, 7-methyl or 6-fluoro.

4,447,436

1,2,3,4-TETRAHYDROISOQUINOLINES 6.10,7,8 DIHYDROXY SUBSTITUTE-1-METHYLANILINO AND USE AS SMOOTH MUSCLE RELAXANTS

Teiji Kishimoto, Kawanishi; Hiromu Kochi, Sakai, and Masayuki Kato, Ikeda, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 628,935, Nov. 5, 1975, Pat. No. 4,220,647. This application Jan. 4, 1980, Ser. No. 109,531

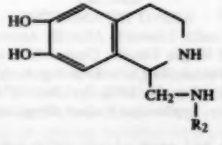
Claims priority, application Japan, Nov. 6, 1974, 49-128479; Nov. 15, 1974, 49-132287; Dec. 12, 1974, 49-143293

The portion of the term of this patent subsequent to Sep. 2, 1997, has been disclaimed.

Int. Cl.³ A61K *31/47*; C07D *217/04*

U.S. Cl. 424—258 **5 Claims**

1. 1,2,3,4-Tetrahydroisoquinolines of the formula:



wherein R_2 is phenyl containing 1 to 3 lower alkoxy substituents, and pharmaceutically acceptable salts thereof.

5. A method of relaxing smooth muscles in mammals which comprises administering an amount of a compound of claim 1 sufficient for effectively relaxing said smooth muscles.

4,447,437

PHARMACEUTICAL COMPOSITION AND METHOD FOR TREATMENT OF PEPTIC ULCER

Haruo Ohnishi; Chihiro Itoh, both of Chiba, and Ei Mochida, Tokyo, all of Japan, assignors to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan

Filed May 24, 1982, Ser. No. 381,324
Claims priority, application Japan, Jun. 3, 1981, 56-140553
Int. Cl.³ A61K *31/44*
U.S. Cl. 424—263 **13 Claims**

1. A method for treating a patient suffering from peptic ulcer, comprising administering an amount therapeutically effective agent peptic ulcer of an agent comprising 2-N-methyl-1,2,3,4-tetrahydro-9H-dibenzo[a,e]pyridino[3,4-c]-cycloheptatriene (MO-8282) or its pharmaceutically acceptable salt to said patient.

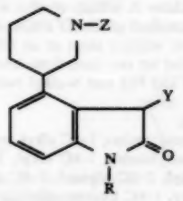
4,447,438

DOPAMINERGIC STIMULATING PIPERIDIN-3-YL-INDOLES

Lucien Ledelec, Le Raincy; Jacques Guillaume, Le Pre Saint Gervais, and Claude Dumont, Nogent sur Marne, all of France, assignors to Roussel Uclaf, Paris, France

Filed Jul. 6, 1982, Ser. No. 395,644
Claims priority, application France, Jul. 24, 1981, 81 14428
The portion of the term of this patent subsequent to Mar. 6, 2001, has been disclaimed.
Int. Cl.³ A01K *31/445*; C07D *401/04*
U.S. Cl. 424—267 **10 Claims**

1. A compound selected from the group consisting of piperidin-3-yl-indoles of the formula



wherein R is selected from the group consisting of hydrogen, alkyl of 1 to 8 carbon atoms and aralkyl of 7 to 12 carbon atoms, Y is alkyl of 1 to 8 carbon atoms, Z is selected from the group consisting of hydrogen, alkyl of 1 to 8 carbon atoms, hydroxyalkyl of 2 to 8 carbon atoms, cycloalkylalkyl of 4 to 12 carbon atoms, alkenyl and alkynyl of 3 to 8 carbon atoms, aryloxyalkyl of 7 to 12 carbon atoms and aralkyl of 7 to 12 carbon atoms optionally substituted with at least one member of the group consisting of halogen, alkoxy and alkyl of 1 to 4 carbon atoms, —OH, —CF_3, —OCF_3, —NO_2 and —NH_2 and their non-toxic, pharmaceutically acceptable acid addition salts.

8. A method of inducing dopaminergic stimulating activity in warm-blooded animals comprising administering to warm-blooded animals a dopaminergic stimulating effective amount of at least one compound of claim 1.

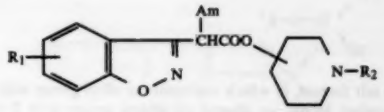
4,447,439

2-CYCLIC AMINO-2-(1,2-BENZISOXAZOL-3-YL)ACETIC ACID ESTER DERIVATIVES, PROCESS FOR THE PREPARATION THEREOF AND COMPOSITION CONTAINING THE SAME

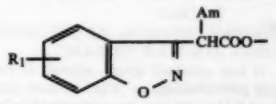
Haruki Nishimura, Ikeda; Shunsuke Naruto, Ikoma; Hiroyuki Mizuta, Nishinomiya; Toshiaki Kadokawa, Hirakata, and Katsuyoshi Kawashima, Kobe, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

Filed Aug. 25, 1982, Ser. No. 411,515
Claims priority, application Japan, Aug. 26, 1981, 56-134600
Int. Cl.³ C07D *413/14*; A61K *31/42*
U.S. Cl. 424—267 **24 Claims**

1. A tertiary amine compound of the formula:

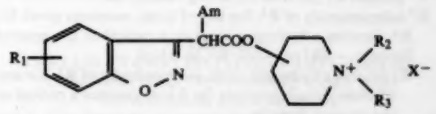


wherein R_1 is hydrogen or halogen atom, R_2 is a lower alkyl group, Am is a 5- to 9-membered saturated cyclic amino group which may be substituted by a lower alkyl group, and the group:

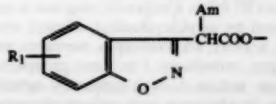


binds to the piperidine moiety at 3- or 4-position of the latter, or a pharmaceutically acceptable acid addition salt thereof.

5. A quaternary ammonium salt of the formula:



wherein R_1 is hydrogen or a halogen atom, R_2 is a lower alkyl group, R_3 is an alkyl group or a phenylalkyl group which may be substituted by a lower alkoxy or methylenedioxy group, Am is a 5- to 9-membered saturated cyclic amino group which may be substituted by a lower alkyl group, X^- is a pharmaceutically acceptable anion, and the group:



binds to the piperidine moiety at 3- or 4-position of the latter.

4,447,440

SULPHENAMIDES-CONTAINING LIPOXYGENASE INHIBITING AGENTS AND THEIR USE IN PHARMACEUTICAL COMPOSITIONS

Wolf-Dieter Busse, Wuppertal; Edmund Krauthausen, Cologne, and Mithat Mardin, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

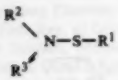
Filed Apr. 14, 1982, Ser. No. 368,193

Claims priority, application Fed. Rep. of Germany, May 7, 1981, 3118126

Int. Cl.³ A61K *31/41*

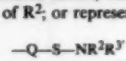
U.S. Cl. 424—269 12 Claims

1. A pharmaceutical composition containing as an active ingredient a lipoxygenase-inhibiting amount of a compound which is a sulphenamide of the formula



(I)

or a salt thereof, in which represents an alkyl group with 1 to 18 carbon atoms, an alkenyl or alkinyl group with 2 to 12 carbon atoms, an aralkyl group with 7 to 11 carbon atoms, a cycloalkyl group with 5 to 8 carbon atoms or an aryl group with 6 to 14 carbon atoms, these radicals being optionally substituted with up to 5 identical or different substituents selected from alkoxy, alkyl, aralkyl, cycloalkyl, aryl, aryloxy, arylthio, alkylthio, carboxyl, carbalkoxy, cyano, carbamoyl, sulphonyl, halogenoalkyl, halogenoalkoxy, halogen, amino or substituted amino; independently of R^2, has any of the meanings of R^2; or represents a radical of the formula



(Ia)

in which

R^2 has the meaning given below,

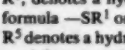
$R^{3'}$ independently of R^3 has the meaning given below for R^3, except a radical of formula (Ia),

Q represents an alkylene radical with 1 to 12 carbon atoms which is optionally interrupted by one or more oxygen, sulphur or nitrogen atoms, or represents a cycloalkylene radical with 5 to 12 carbon atoms, an arylene radical with 6 to 10 carbon atoms, an alkylene-cycloalkylene-alkylene or alkylene-arylene-alkylene radical,

R^2 denotes an electron-attracting radical, and

R^3 independently of R^1, has any of those meanings given for R^1, denotes a hydrogen atom or a radical of the general formula $—SR^1$ or $—NR^2R^5$, in which

R^5 denotes a hydrogen atom, independently of R^1, has any of those meanings given for R^1, or denotes a radical of the general formula



(Ib)

in which

$R^{3''}$ independently of R^3, has any of those meanings given for R^3, other than $—NR^2R^5$,

$R^{5'}$ has any of those meanings given for R^5 except a radical of formula (Ib),

W represents a direct bond, a disulphide bridge or one of the bridge members mentioned above for Q, and R^1 and R^2 have the meaning mentioned above, or

R^3 together with R^2 forms a tetrazolyl ring and is optionally substituted by alkyl, cycloalkyl, alkenyl, aralkyl, aryl, alkoxy, aryloxy, alkylmercapto, mercapto, amino, cyano, halogen, carbalkoxy, 1 to 3 oxo groups, 1 or 2 thiono groups and/or 1 or 2 optionally substituted imino groups, in admixture with an inert pharmaceutical carrier.

4,447,441

HALOALKYLGUANIDINE COMPOUNDS, PHARMACEUTICAL COMPOSITIONS AND METHODS, PROCESSES AND INTERMEDIATES

Tobias O. Yellin, Fremont, Calif., and David J. Gilman, Macclesfield, England, assignors to Imperial Chemical Industries PLC, London, England

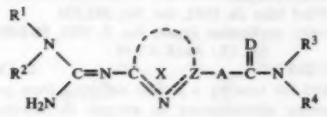
Filed Mar. 1, 1982, Ser. No. 353,502

Claims priority, application United Kingdom, Mar. 9, 1981, 8107273; Sep. 17, 1981, 8128179

Int. Cl.³ C07D *231/38, 249/04;* A61K *31/41, 31/415*

U.S. Cl. 424—269 9 Claims

1. A guanidine derivative of the formula I:



I

in which R^1 and R^2, which may be the same or different, are hydrogen or branched or unbranched 1–10C alkyl, 3–8C cycloalkyl or 4–14C cycloalkylalkyls, each alkyl, cycloalkyl or cycloalkylalkyl being optionally substituted by one or more halogens selected from fluorine, chlorine and bromine, provided that at least one of R^1 and R^2 is a halogen-substituted alkyl, cycloalkyl or cycloalkylalkyl, and provided that there is no halogen substituent on the carbon of the alkyl, cycloalkyl or cycloalkylalkyl which is directly attached to the nitrogen atom;

in ring X is selected from oxazole, thiazole, imidazole, 1,2,4-thiadiazole, 1,2,4-oxadiazole, 1,2,3-triazole, 1,2,4-triazole and pyrazole, and which heterocyclic ring may, where possible, carry one or two optional substituents, the optional substituents on ring X being selected from fluorine, chlorine, bromine, 1–6C alkyl, 1–6C alkoxy, trifuloromethyl, hydroxy and amino radicals; —A— is a phenylene or 5–7C cycloalkylene radical or a 1–8C alkylene chain which is optionally substituted by one or two 1–3C alkyls radicals and into which is optionally inserted, as part of the backbone of the chain, one or two groups selected from oxygen and sulphur atoms and NH, 1–6C N-alkyl, cis and trans vinylene, ethynylene, phenylene and 5–7C cycloalkylene radicals, provided that the shortest link between ring X and C=D is of at least 3 atoms, provided that when an optional insertion is made in chain A which results in the inserted group being directly attached to C=D the inserted group is other than an oxygen or sulphur atom or an NH or N-alkyl radical, and provided that no two insertions selected from oxygen and sulphur atoms and NH and N-alkyl radicals are directly attached one to the other;

D is an oxygen or sulphur atom;

R^3 is a hydrogen atom or a hydroxy, amino, 1–6C alkyl-amino, 1-C haloalkylamino, 1–6C alkanoylamino, 1–6C alkyl, 3–8C cycloalkyl, 4–12C cycloalkylalkyl, 2–6C alkenyl, 2–6C alkynyl, 1–6C haloalkyl, 1–6C alkoxy, 1–6C hydroxyalkyl, 2–10C alkoxyalkyl, 2–10C alkylthioalkyl, 1–6C aminoalkyl, 2–8C alkylaminoalkyl, 3–12C dialkylaminoalkyl, 2–8C alkanoylaminoalkyl, 8–14C benzoylaminoalkyl, 3–10C alkoxycarbonylalkyl, 2–8C carbamoylalkyl, phenyl, 7–11C phenylalkyl, heteroaryl or heteroarylalkyl radicals, wherein the heteroaryl part is a furan, thiophene, pyrrole, thiazole, oxazole, imidazole, thiadiazole, oxadiazole, triazole, pyrazole, pyridine or pyrimidine ring, wherein the alkyl part of the heteroarylalkyl radical is 1–6C and wherein, when R^3 is or contains a phenyl or heteroaryl ring, that ring is optionally substituted by one or two groups selected from fluorine, chlorine, bromine and iodine atoms and 1–6C alkyl, 1–6C alkoxy, 1–6C alkylthio, 2–6C dialkylamino, 2–6C alkanoyl, trifluoromethyl, hydroxy and amino radicals; R^4 is a hydrogen atom or R^3 and R^4 are joined to form, together with the nitrogen atom to which they are attached, a pyrrolidine, piperidine, morpholine, pipevazine or N-methylpiperazine ring;

and the pharmaceutically-acceptable acid-addition salts thereof.

4,447,442

3-TRIFLUOROACETYLAMINO-1-ARYL-2-PYRAZOLINES

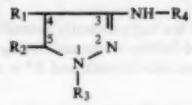
John P. Dusza, Nanuet, N.Y.; Joseph P. Joseph, Montvale, N.J., and Seymour Berstein, New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 282,972, Jul. 13, 1981, Pat. No. 4,348,527. This application Aug. 9, 1982, Ser. No. 406,603

Int. Cl.³ A01N *43/56*; A61K *31/415*

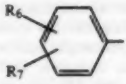
U.S. Cl. 424—273 P **52 Claims**

1. A method of meliorating inflammation in a mammal which comprises administering to said mammal an effective anti-inflammatory amount of a compound selected from those of the formula:



wherein R_1 is hydrogen or lower alkyl (C_1–C_4); R_2 is hydrogen, lower alkyl (C_1–C_4), phenyl or

where R_5 is halogen; R_3 is



where R_6 and R_7 are the same or different and may be hydrogen, chloro, fluoro, lower alkyl (C_1–C_4), trifluoromethyl or $COCF_3$; R_4 is —CHO or —$COCF_3$ with the proviso that when R_4 is —CHO then R_2 is phenyl or

where R_5 is halogen; or a nontoxic pharmaceutically acceptable salt thereof.

4,447,443

ANTI-INFLAMMATORY/ANALGESIC COMBINATION OF α-FLUOROMETHYLHISTIDINE AND A SELECTED NON-STEROIDAL ANTI-INFLAMMATORY DRUG (NSAID)

Marvin M. Goldenberg, Westfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 15, 1982, Ser. No. 441,581

Int. Cl.³ A61K *31/40, 31/415*

U.S. Cl. 424—273 R **6 Claims**

1. A pharmaceutical combination for pain and anti-inflammatory management comprising a therapeutically effective amount of indomethacin or a pharmaceutically acceptable non-toxic salt thereof and α-fluoromethylhistidine in an amount sufficient to enhance the efficacy of indomethacin wherein the weight ratio of indomethacin to α-fluoromethylhistidine is from about 1:100 to about 1:3.

4,447,444

1-ALKYL-3-ALKOXYMETHYL-4-ALKOXY-5-DIALKYLCARBAMOYLOXY PYRAZOLES AND USE AS APHICIDES

Gerhard Stähler, and Anna Waltersdorfer, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

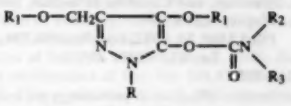
Continuation-in-part of Ser. No. 227,236, Jan. 22, 1981, abandoned. This application Jan. 13, 1983, Ser. No. 457,699

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1980, 3002413

Int. Cl.³ A01N *43/56*; C07D *231/28*

U.S. Cl. 424—273 P **6 Claims**

1. N,N-dialkyl-O-[pyrazol-5-yl]-carbamic acid esters of the formula



in which R is alkyl of 2 to 4 carbon atoms, unsubstituted or substituted by CN, and R_1, R_2, and R_3 are alkyl of 1 to 4 carbon atoms.

6. A method for combating noxious aphids which comprises treating the aphids or the aphid infested crop plants with an effective amount of a compound as claimed in claim 1.

4,447,445

MANOALIDE, AN ANTI-INFLAMMATORY ANALGESIC MARINE NATURAL PRODUCT

Robert S. Jacobs, Santa Barbara, and D. John Faulkner, La Jolla, both of Calif., assignors to The Regents of the University of Calif., Berkeley, Calif.

Filed Aug. 3, 1983, Ser. No. 519,852

Int. Cl.³ A61K *31/335*

U.S. Cl. 424—279 **6 Claims**

1. The method of treating mammals including humans in need of a drug having analgesic and/or anti-inflammatory activity comprising the administration to said mammals of a therapeutically effective amount of manoalide, seco-manoalide or dehydro-seco-manoalide.

4,447,446

CERTAIN CYANO CONTAINING ARYL AMIDES, COMPOSITIONS CONTAINING SAME AND FUNGICIDAL USE THEREOF

Ian T. Kay; David Bartholomew, both of Wokingham; Emyr G. Williams, Reading, and Robert A. Noon, Cricklewood, all of England, assignors to Imperial Chemical Industries PLC, London, England

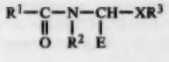
Filed Feb. 26, 1982, Ser. No. 353,006

Claims priority, application United Kingdom, Mar. 4, 1981, 8106817; May 12, 1981, 8114393

Int. Cl.³ C07D *121/52*; C07C *317/60*; A01N *43/02, 37/34*

U.S. Cl. 424—282 **18 Claims**

1. An amide derivative of the formula (I)



wherein

R^1 is phenyl optionally substituted with halogen, lower alkyl, lower alkoxy, halo-lower alkoxy, methylenedioxy, lower alkylthio or cyano;

R^2 is hydrogen, C_1–C_4 alkyl or C_3–C_5 alkenyl;
X is oxygen or sulphur;
R^3 is lower alkyl, lower halcalkyl or lower alkenyl; and
E is —CN.

17. A method for combating fungi which comprises applying to the fungi, or the locus thereof, a fungicidally effective amount of a compound as defined in claim 1.

18. A method of combating fungal disease in a plant which comprises applying to the plant, to the seed of the plant, or to the locus of the plant, or seed, a compound as defined in claim 1.

4,447,447

COMPOSITION, METHOD OF PREPARATION THEREOF, METHOD OF APPLICATION, APPARATUS FOR THE CONTROL OF LARVAE OF THE GYPSY MOTH AND OTHER HARDWOOD DEFOLIATORS

Bohdan O. Hreschak, and Christine Hreschak, both of 55 Cecelia Dr., Wayne, N.J. 07470

Filed Mar. 10, 1982, Ser. No. 356,738
Int. Cl.³ A01N *43/08*
U.S. Cl. 424—285 **13 Claims**

1. A composition effective to prevent gypsy moth caterpillars and other hardwood defoliators from ascending trees and devouring their foliage, comprising: a mixture of (a) 0.05–10.0 parts of at least one aliphatic aldehyde with 2–7 carbon atoms, (b) 0.05–10.0 parts of at least one sulfur compound which is dibutyl disulfide, or a mixture of dibutyl disulfide and dimethyl sulfide, (c) 0.05–10.0 parts of at least one diketofuran with carbon atoms ranging from 5 to 7, (d) 0.10–20 parts of at least one carboxylic acid with 4–6 carbon atoms, (e) a solvent in the amount of 0–50 parts and (f) 50–99.5 parts of a bulking agent.

4,447,448

WOOD PRESERVATIVE

Wolfgang Reuther, Heidelberg, and Hans-Volker Borck, Baden-Baden, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 13, 1982, Ser. No. 449,317
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1981, 3151806
Int. Cl.³ A01N *43/08, 33/02*
U.S. Cl. 424—285 **2 Claims**

1. A composition for protecting wood against attack by wood-destroying fungi comprising a mixture of

(A) N-cyclohexyl-N-methoxy-2,5-dimethyl-furan-3-carboxamide

and

(B) tris-(N-cyclohexyl-diazeniumdioxy)-aluminum in a weight ratio of A to B of from about 1:3 to 3:1.

4,447,449

METHODS OF TREATING ISCHEMIC STATES

Norman B. Marshall, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 16, 1981, Ser. No. 321,367
Int. Cl.³ A61K *31/275, 31/34, 31/35*
U.S. Cl. 424—304 **5 Claims**

1. A method of arresting or preventing a pathological cardiovascular ischemic state (PACVIS) in an animal exhibiting or particularly susceptible to development of said PACVIS which comprises:

systemically administering to said animal an anti-PACVIS biologue in not less than a non-toxic amount effective to treat or prevent said PACVIS which comprises from 0.0001 mg to 400 mg per dose.

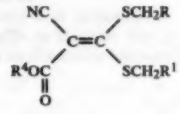
4,447,450

2,2-BIS(HALOALKENYL)-1-CYANO-1-ALKOXYCARBONYLETHYLENE FUNGICIDES

Andrew W. Ho, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 25, 1982, Ser. No. 361,652
Int. Cl.³ C07C *121/30*; A01N *37/34*
U.S. Cl. 424—304 **1 Claim**

1. A method of controlling grape downy mildew caused by *Plasmopara viticola* fungi which comprises applying to the fungus or its habitat a fungicidally effective amount of a compound having the formula:



wherein R and R^1 are independently substituted lower alkenyl having 2 through 6 carbon atoms and having 1 to 3 of the same or different halogen substituents; and R^4 is methyl or ethyl.

4,447,451

TREATMENT OF ADULT RESPIRATORY DISTRESS SYNDROME

Jerry C. Mueller, Kalamazoo, Mich., assignor to The Upjohn Manufacturing Company M, Puerto Rico

Continuation of Ser. No. 284,656, Jul. 20, 1981, abandoned. This application Dec. 6, 1982, Ser. No. 447,052
Int. Cl.³ A61K *31/19*
U.S. Cl. 424—317 **2 Claims**

1. A process for treating adult respiratory distress syndrome comprisig the systemic administration to a human or animal having adult respiratory distress syndrome of an effective amount of p-isobutylhydratropic acid or an alkyl ester of from 1 to 8 carbon atoms, inclusive, including isomeric forms thereof, or a pharmacologically acceptable salt thereof.

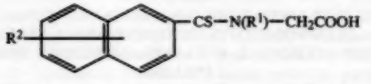
4,447,452

N[(2-NAPHTHALENYL)THIOXOMETHYL]GLYCINE DERIVATIVES

Kazimir Sestanj, St. Laurent, Canada, assignor to Ayerst, McKenna & Harrison Inc., Montreal, Canada

Filed Nov. 13, 1981, Ser. No. 321,303
Claims priority, application Canada, Mar. 2, 1981, 372024
Int. Cl.³ C07C *153/05*; A61K *31/195*
U.S. Cl. 424—319 **9 Claims**

1. A compound of formula I



wherein R^1 is lower alkyl, and R^2 is hydrogen or a lower alkyl, lower alkoxy, halo or trifluoromethyl substituent on the naphthalene ring, or a therapeutically acceptable salt thereof with an organic or inorganic base.

6. A pharmaceutical composition for preventing or relieving diabetic complications in a diabetic mammal which comprises a compound of claim 1, or a therapeutically acceptable salt thereof with an organic or inorganic base, and a pharmaceutically acceptable carrier.

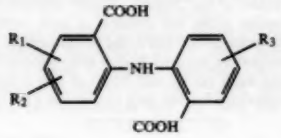
4,447,453

ANTI-PEPTIC ULCER AGENT

Mitsura Tanemura, Tokyo; Tamotsu Yamazaki; Koji Mizuno, both of Saitama; Shin-ichi Kaibo, Chiba; Morio Kakimoto; Eiichi Hoshino, both of Saitama; Isao Matsunaga, Tokyo, and Shun-ichi Hata, Kanagawa, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1981, Ser. No. 322,182
Claims priority, application Japan, Nov. 28, 1980, 55-166662
Int. Cl.³ A61K *31/195*
U.S. Cl. 424—319 12 Claims

1. A therapeutic method of treating peptic ulcer which comprises administering to a human in need of said therapy an effective amount for treating peptic ulcer of an active compound of the formula



wherein R_1, R_2 and R_3 which may be the same or different represent a hydrogen atom, halogen atom, lower alkyl group or lower alkoxy group but they do not all represent a hydrogen atom at the same time, or pharmaceutically acceptable salt thereof.

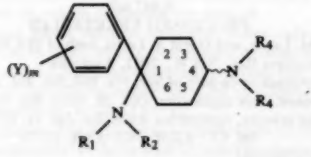
4,447,454

ANALGETIC COMPOUNDS, COMPOSITIONS AND PROCESS OF TREATMENT

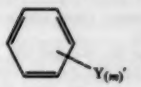
Daniel Lednicer, Evansville, Ind., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 897,105, Apr. 17, 1978, abandoned, Division of Ser. No. 783,806, Apr. 1, 1977, Pat. No. 4,113,866. This application May 15, 1981, Ser. No. 263,840
Int. Cl.³ A10N *33/02, 37/30;* C07C *87/34*
U.S. Cl. 424—330 11 Claims

1. A compound of the formula:



wherein R_1 is hydrogen, alkyl of from 1 to 8 carbon atoms, CH_2-alkenyl wherein alkenyl is from 2 to 4 carbon atoms, inclusive, cycloalkyl of from 3 to 6 carbon atoms, inclusive, or cycloalkylmethyl of from 3 to 6 carbon atoms, inclusive: R_2 is hydrogen, or alkyl of from 1 to 8 carbon atoms, inclusive, with the proviso that R_1 and R_2 cannot both be hydrogen at the same time; Y is alkyl of from 1 to 4 carbon atoms, inclusive, halogen, trifluoromethyl, hydroxy, alkoxy of from 1 to 4 carbon atoms, inclusive, cycloalkyloxy of from 3 to 6 carbon atoms, inclusive, or benzyloxy; m is an integer 0, 1, or 2; R_3 is alkyl of from 1 to 4 carbon atoms, inclusive; R_4 is alkyl of from 1 to 4 carbon atoms, inclusive, CH_2-alkenyl wherein alkenyl is of from 2 to 4 carbon atoms, inclusive, and arylalkyl wherein alkyl is from 1 to 4 carbon atoms, inclusive, and aryl is



wherein Y' is CF_3, halogen, alkyl of 1 to 4 carbon atoms, inclusive, and alkoxy of from 1 to 4 carbon atoms, inclusive; and its acid addition salts.

4,447,455

ORAL UROLITHIASIS REMEDY

Rolf Madaus, Köln-Brück, and Werner Stumpf, Bensberg-Refrath, both of Fed. Rep. of Germany, assignors to Madaus and Company, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 211,988, Dec. 1, 1980, abandoned, which is a continuation of Ser. No. 101,611, Dec. 10, 1979, abandoned. This application Aug. 5, 1982, Ser. No. 405,631
Int. Cl.³ A61K *31/12*
U.S. Cl. 424—331 7 Claims

1. A composition for the treatment of urolithiasis comprising effective amounts of
alizarin,
magnesium oxide,
disodium hydrogen phosphate, and
potassium hydrogen phosphate.

2. Composition as claimed in claim 1 comprising

5 to 14%	alizarin,
10 to 26%	magnesium oxide,
22 to 32%	disodium hydrogen phosphate, and
37 to 53%	potassium dihydrogen phosphate.

4,447,456

STRAIN OF *CORYNEBACTERIUM FASCIANS* AND USE THEREOF TO REDUCE LIMONOID BITTERNESS IN CITRUS PRODUCTS

Shin Hasegawa, Pasadena, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 10, 1983, Ser. No. 456,954
Int. Cl.³ A23L *1/00;* C12R *1/15*
U.S. Cl. 426—51 15 Claims

1. A biologically pure culture of *Corynebacterium fascians* NRRL B-15096 which is further identified as having the capability of producing enzymes which convert bitter limonoids to nonbitter compounds without the presence of a limonoid inducer in the growth medium.

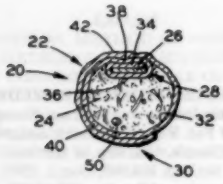
5. The process for reducing bitterness in limonoid-containing citrus products, which comprises contacting the citrus product with the bacterium *Corynebacterium fascians* NRRL B-15096 which is further identified as having the capability of producing enzymes which convert bitter limonoids to nonbitter compounds without the presence of a limonoid inducer in the growth medium.

4,447,457

READILY PORTABLE FOOD ITEM

Eddie L. Bernal, Defiance, Ohio, assignor to Taco Operations, Inc., Defiance, Ohio

Continuation-in-part of Ser. No. 389,705, Jun. 18, 1982, which is a division of Ser. No. 342,380, Jan. 25, 1982, Pat. No. 4,399,156.
This application May 25, 1983, Ser. No. 498,148
The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.
Int. Cl.³ A21D 13/00; A23L 1/00
U.S. Cl. 426—91 20 Claims



1. A portable food item comprising an edible sheet in a self-sustaining state, a substantially rigid and self-supporting elongate member capable of being hand held and supporting the edible sheet, said elongate member having a substantial portion of its length projecting beyond an edge of said sheet with the remaining portion of the member having an edge portion of the sheet affixed thereto by being wrapped completely therearound from said edge portion of said sheet toward an opposite edge portion thereof, with the remaining portion of the edible sheet, which is a major portion of the sheet, forming a chamber contiguous with the wrapped portion, a food filler contained within said chamber, said sheet having one edge portion between the aforesaid edge portions at an end of said chamber turned over the food filler and extending into the chamber to enclose an end of said chamber, said sheet having another edge portion at the other end of said chamber closed off to enclose the other end of said chamber, said sheet being at least partially cooked and in a semi-rigid, self-sustaining state.

14. A method of making a portable food item comprising providing a soft, edible sheet of predetermined shape, laying the edible sheet on a surface, positioning an elongate member on the sheet with a substantial portion of its length projecting beyond an edge of the sheet a sufficient distance to be hand held and located asymmetrically on the sheet with a large portion of the sheet on one side of the elongate member and a smaller portion of the sheet on the opposite side of the elongate member, said elongate member further being positioned with an edge portion of the large portion of the sheet extending beyond an end of the elongate member on the sheet, turning back the edge portion of the large portion of the sheet which is beyond the end of the member, wrapping the smaller portion of the sheet and part of the large portion around the elongate member, placing a food filler on an inner part of the remaining portion of the large portion of the sheet which is adjacent the wrapped elongate member and under the turned back edge portion, positioning the remaining portion of the large portion around the food filler and with an outer part of the remaining portion of the large portion in overlapping relationship with the wrapped portion to circumferentially enclose the food filler, and immersing the sheet and filler in hot liquid to cause the wrapped portion of the sheet to swell and become secured more fully to the elongate member and to render the sheet in a substantially self-sustaining state.

4,447,458

METHOD OF AND APPARATUS FOR PRODUCING AND PROCESSING FROZEN CONFECTIONS

Thomas E. Roth, Sylvania, and Harlan R. Getman, Toledo, both of Ohio, assignors to Vroman Foods, Inc., Toledo, Ohio

Filed Jun. 1, 1982, Ser. No. 383,793
Int. Cl.³ A23G 9/00, 9/22
U.S. Cl. 426—275 25 Claims

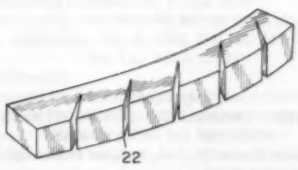
1. The method of processing freezable soft confection comprising advancing the soft confection as a column, establishing a quantity of particulate edible material adjacent the column of soft confection, agitating the particulate edible material, feeding the particulate edible material into contact with the peripheral region of the column of soft confection, moving the column of soft confection and particulate material through a restriction for impressing the particulate material into the peripheral region of the column of soft confection, severing successive bodies from the column of soft confection and particulate material embedded in the peripheral region thereof, delivering successive severed bodies onto successive cookies, and delivering each cooky and body of soft confection to a reduced temperature for freezing the bodies onto the cookies.

4,447,459

PREPARATION OF PAR-FRIED POTATO PIECES

John J. Balboni, Nash Rd., Purdys, N.Y. 10578, and Leon Hong, 29 Cottage Ct., Freeport, N.Y. 11520

Filed Mar. 15, 1983, Ser. No. 475,523
Int. Cl.³ A23L 1/216
U.S. Cl. 426—441 18 Claims



1. A process for preparing par-fried potato pieces comprising: cutting a potato to form pieces par-frying the potato pieces in hot oil under conditions effective to form a skin over the outer surfaces of the potato pieces, and then disrupting the outer surface skin of the potato pieces to expose the interior of the potato pieces.

4,447,460

PROCESSED VEGETABLES

Victor M. Lewis, and David A. Lewis, both of 19A Boundary St., Rushcutters Bay, N.S.W., 2011, Australia

Continuation-in-part of Ser. No. 165,294, Jul. 2, 1980, abandoned. This application Oct. 28, 1981, Ser. No. 315,723
Claims priority, application Australia, Jul. 11, 1979, PD 9542
Int. Cl.³ A23B 7/02; A23L 1/212
U.S. Cl. 426—541 11 Claims

1. A process for dehydrating a vegetable to a desired moisture content and a water activity level at 20° C. of from 0.45 to 0.85, comprising the steps of

(a) partially dehydrating said vegetable, allowing at least 10% residual moisture to remain;

(b) adding to and mixing with the partially dehydrated vegetable a predetermined volume, not exceeding 34.6% by weight of the combined weights of the vegetable and solution, of an aqueous solution containing a known quantity of at least one water activity controlling solute selected from the group consisting of sodium chloride and mixtures of sodium chloride and a sugar, said solution containing no other solutes other than flavorings, coloring substances, seasonings, preservatives, salts, nutritional supplements and anti-oxidants, the quantity of said solu-

tion being such that it is totally absorbed by said partially dehydrated vegetable, and the absorption being carried out above 10° C.; and

(c) dehydrating said vegetable to a predetermined moisture content and said water activity level in a final dehydration step, the amounts of sugar and sodium chloride in said solution being such that the sugar content of the final dehydrated vegetable is less than 15% by weight and the sodium chloride content is 3–15% by weight.

4,447,461

SAUCE COMPOSITIONS CONTAINING AGGLOMERATED PARTICLES OF SPECIFIED SIZE DISTRIBUTION

Patricia J. Loos, Glendale; Debra L. Fuqua, Wyoming, and Paul J. Drzewiecki, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 370,806, Apr. 22, 1982, abandoned. This application Mar. 30, 1983, Ser. No. 478,120

Int. Cl.³ A23L *1/22*

U.S. Cl. 426—589 **11 Claims**

1. A sauce comprising at least about 7% by volume of textured protein simulating loose cooked ground meat, but in which the textured protein has a particle size distribution of:

(a) from 0% to about 2% on a 15.9 mm screen;

(b) from about 6% to about 20% on a 12.7 mm screen;

(c) from about 9% to about 18% on a 9.51 mm screen;

(d) from about 27% to about 37% on a 5.66 mm screen;

(e) from about 25% to about 40% through a 4.76 mm screen; and

the balance on a 4.76 mm screen, provided that the sum of (a), (b), (c) and (d) is from about 48% to about 72%.

4,447,462

STRUCTURAL FAT AND METHOD FOR MAKING SAME

Michael W. Tafuri, and Bernard Y. Tao, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 318,161, Nov. 4, 1981, abandoned. This application Jul. 18, 1983, Ser. No. 514,364

Int. Cl.³ A23D *5/00*

U.S. Cl. 426—601 **22 Claims**

10. A solventless method for fractionating palm oil to obtain a structural fat, which comprises the steps of:

(1) heating whole palm oil having an iodine value of from about 50 to about 55 to a temperature of from about 140° F. to about 170° F. until essentially crystal free;

(2) slowly cooling the heated palm oil to a temperature of from about 75° to about 95° F.;

(3) maintaining the palm oil at a temperature of from about 75° to about 95° F. for at least 10 hours to permit crystallization of a first solid fraction having an iodine value of from about 42 to about 47;

(4) separating the first solid fraction from a first liquid fraction having an iodine value of from about 56 to about 61;

(5) heating the first liquid fraction to a temperature of from about 140° F. to about 170° F. until essentially crystal free;

(6) slowly cooling the heated first liquid fraction to a temperature of from about 60° to about 75° F.;

(7) maintaining the first liquid fraction at a temperature of from about 60° to about 75° F. for at least 12 hours to permit crystallization of a second solid fraction having an iodine value of from about 39 to about 47; and

(8) separating the second solid fraction from a second liquid fraction to yield a separated second solid fraction as the structural fat.

4,447,463

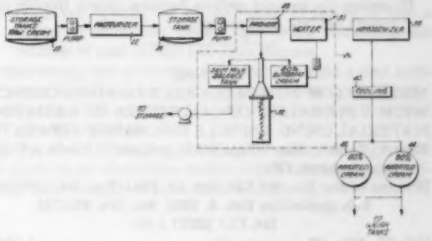
PROCESS FOR PRODUCING A BUTTER/MARGARINE BLEND PRODUCT

Donald E. Antenore, Hudson; Donald W. Schmadeke, and Rodney A. Stewart, both of Waterloo, all of Iowa, assignors to Land O'Lakes, Inc., Arden Hills, Minn.

Filed Nov. 19, 1982, Ser. No. 442,920

Int. Cl.³ A23D *3/02*

U.S. Cl. 426—603 **8 Claims**



1. A churn-free continuous process for producing a margarine/butter spread comprising:

concentrating a dairy cream to approximately at least an 80% butterfat content;

processing the dairy cream through a homogenizer at a pressure and temperature such that the dairy cream is inverted from an oil-in-water emulsion to a water-in-oil emulsion;

mixing the inverted cream with a vegetable oil to form a cream/oil mixture; and

cooling the cream/oil mixture to a temperature effective to produce a spread-like viscous product.

4,447,464

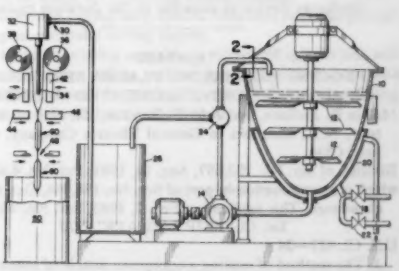
METHOD OF PROCESSING MARGARINE OR BUTTER FOR SQUEEZE PACKET CONTAINERS

Charles A. Schwartz, Highland Heights, and Kenyon L. Cornwell, Lakewood, both of Ohio, assignors to Sar-A-Lee, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 423,063, Sep. 24, 1982, abandoned. This application Dec. 20, 1982, Ser. No. 451,075

Int. Cl.³ A23C *15/00*; A23D *3/02*

U.S. Cl. 426—663 **10 Claims**



1. A method of processing a normally non-flowable margarine or butter product comprising:

(a) mixing said product to a uniform viscosity in a mixing bowl by stirring the product;

(b) heating the mixing bowl to form a thin layer of low viscosity liquid product around the edge of the mixing bowl, said heat being applied to the mixing bowl at a temperature and of short duration such that the liquid product around the edge of the mixing bowl does not undergo irreversible breakdown of its emulsion and such

that only the product contiguous with the bowl is directly heated;

(c) recirculating a portion of the product including the low viscosity liquid product through an additional mixing means and back to the mixing bowl;

(d) repeating steps (a) through (c) until the overall product viscosity is lowered to the range of 16,000 to 18,000 centipoise at 75° F.;

(e) pumping the 16,000 to 18,000 centipoise viscosity product into flexible squeeze packets; and,

(f) sealing the squeeze packets forming closed, flexible containers holding the product.

4,447,465

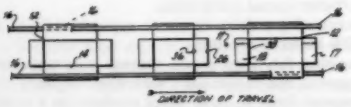
METHOD FOR AUTOMATICALLY COATING OBJECTS WITH A PLURALITY OF QUANTITIES OF A COATING MATERIAL USING A SINGLE DISCHARGE APPARATUS

Timothy S. Matt, Bay Village, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Division of Ser. No. 301,520, Sep. 14, 1981, Pat. No. 4,380,967. This application Feb. 4, 1983, Ser. No. 463,731

Int. Cl.³ B05D *5/00*

U.S. Cl. 427—10 **1 Claim**



1. A method for automatically coating objects with a plurality of quantities of a coating material comprising the steps of:

moving the objects relative to a coating material discharging device in a path past the discharge device;

sensing the presence of an object at a first point on said path upstream of said discharge device;

sensing the presence of the object at a second point on said path downstream of the first point and upstream of the discharge device;

producing a delay signal in response to either of the sensor signals after a delay time corresponding to a predetermined distance of travel by a second object on the path;

producing a duration signal in response to the delay signal for a duration of time corresponding to a predetermined distance of travel by a sensed object on the path; and

controlling the discharge of the coating material from the discharge device in response to the duration signal.

4,447,466

PROCESS FOR MAKING PLASMA SPRAY-CAST COMPONENTS USING SEGMENTED MANDRELS

Melvin R. Jackson, and John R. Rairden, III, both of Schenectady, N.Y., assignors to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 292,857, Aug. 14, 1981, Pat. No. 4,418,124, which is a continuation-in-part of Ser. No. 194,084, Oct. 6, 1980, abandoned. This application Feb. 2, 1983, Ser. No. 463,207

Int. Cl.³ B22F *3/00*; **A23C** *9/12*

U.S. Cl. 427—34 **9 Claims**

1. The method of making a composite article of manufacture having a plurality of hollow passageways by means of a segmented mandrel comprising the steps of:

(a) providing at least a first mandrel segment, said first mandrel segment having a top surface, a bottom surface, and a peripheral edge surface area interconnecting said top and bottom surfaces, said peripheral edge area defining the shape of said mandrel segment;

(b) plasma spray-casting a first superalloy material onto at least said peripheral edge surface area of said first mandrel segment;

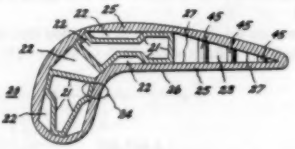
(c) bringing the product of step (b) into a contacting relationship with at least a second mandrel segment, said second mandrel segment having a top surface, a bottom surface and a peripheral edge area, at least a portion of the peripheral edge area of said second mandrel being in contact with at least a portion of said first superalloy material on the peripheral edge surface area of said first mandrel segment, thereby leaving at least a portion of the peripheral edge area of said second mandrel segment and at least a portion of the first superalloy material on the peripheral edge surface area of said first mandrel segment exposed, forming thereby a completed segmented mandrel assembly resting on the bottom surfaces of said mandrel segments;

(d) plasma spray-casting a second superalloy material having a composition different from the composition of said first superalloy material onto at least the exposed peripheral edge area of said second mandrel segment and over at least a portion of the exposed superalloy material on the peripheral edge surface area of said first mandrel segment; and

(e) selectively dissolving the mandrel segments thereby creating said hollow passageways.

4. The method of making a composite airfoil having a plurality of hollow passageways by means of a segmented mandrel comprising the steps of:

(a) providing a segmented mandrel consisting of a plurality of individual segments, each segment having a top surface, a bottom surface and a peripheral edge surface area, said peripheral edge areas defining the shapes of said mandrel segments;



(b) plasma spray-casting a first superalloy material onto at least the peripheral edge areas of first and second mandrel segments;

(c) bringing the products of step (b) into a contacting relationship with a third mandrel segment, said third mandrel segment being interposed between said first and second mandrel segments such that a portion of the peripheral edge area of said third segment is in contact with a portion of the first superalloy on the peripheral edge area of said first segment and yet a different portion of the peripheral edge area of said third segment is in contact with a portion of the first superalloy on the peripheral edge area of said second segment;

(d) bringing forth and fifth mandrel segments into a contacting relationship with said first mandrel segment such that a portion of the peripheral edge areas of said fourth and fifth segments are in contact with a portion of the first superalloy on the peripheral edge area of said first mandrel segment, said fourth and fifth segments being substantially opposite and displaced from each other and displaced from the third mandrel segment;

(e) bringing sixth, seventh and eighth mandrel segments into a contacting relationship with said second mandrel segment such that a portion of the peripheral edge areas of said sixth, seventh, and eighth mandrel segments are in contact with a portion of the first superalloy on the peripheral edge area of said second mandrel segment, said sixth and seventh mandrel segments being substantially opposite from each other, said eighth mandrel segment being substantially opposite said third mandrel segment, said sixth, seventh, and eighth mandrel segments being displaced from each other and from the third mandrel

segment, forming thereby a completed segmented mandrel assembly resting on the bottom surfaces of said mandrel segments;

(f) plasma spray-casting a second superalloy material having a composition different from the composition of said first superalloy onto at least the portions of the peripheral edge areas of the third, fourth, fifth, sixth, seventh, and eighth mandrel segments not in contact with the first superalloy material and onto at least those portions of the first superalloy material on the first mandrel segment which are not covered by the third, fourth and fifth mandrels, and onto at least those portions of the first superalloy material on the second mandrel segment which are not covered by the third, sixth, seventh and eighth mandrel segments; and

(g) selectively dissolving the mandrel segments thereby creating a plurality of hollow passageways.

4,447,467

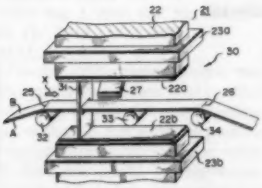
METHOD AND APPARATUS FOR PERPENDICULAR MAGNETIC RECORDING MEDIUM

Toshihiko Oguchi, Atsugi; Hirohisa Kato, Ebina, and Hirotaka Yokoyama, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 23, 1983, Ser. No. 478,103

Int. Cl.³ H01F *10/02;* **B05C** *11/00;* **B05D** *3/06;* **B05B** *5/00*

U.S. Cl. 427—48 **12 Claims**



1. A method for manufacturing a perpendicular magnetic recording medium, comprising the steps of:

(a) generating a magnetic field which has an intensity of not less than 4,000 oersteds;

(b) passing a nonmagnetic substrate having a coating layer thereon through said magnetic field in one direction substantially perpendicular to a direction of said magnetic field, said coating layer comprising a binder and magnetic particles which have a particle size of not more than 0.2 μm and are dispersed in said binder, and said coating layer having a viscosity of not more than 5×10^4 centipoises as measured at a shearing speed of 8.0 sec^{-1};

(c) orienting said magnetic particles in said coating layer in an upstream region of said magnetic field such that an axis of easy magnetization of said magnetic particles is aligned with the direction of said magnetic field; and

(d) treating said coating layer which includes said magnetic particles which have been oriented, in a downstream region of said magnetic field such that a viscosity of said coating layer is increased to at least 10^5 centipoises as measured at a shearing speed of 8.0 sec^{-1}, thereby restricting further movement of said magnetic particles in said coating layer before said coating layer is removed from said magnetic field.

4,447,468

PHOTOGRAPHIC FILM COATING APPARATUS AND METHOD

John B. Keable, Spring Valley, Ohio, assignor to QMI Corporation, Centerville, Ohio

Filed Mar. 21, 1983, Ser. No. 477,205

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—54.1 **10 Claims**

1. The method of applying a protective ultraviolet curable coating to the surface of film on discs of film carried on spindles, comprising the steps of:

partially lowering a spindle carrying thereon a plurality of such discs to submerge the films thereon in a pool of such coating and slowly rotating the spindle to coat each film carried thereon with said coating,

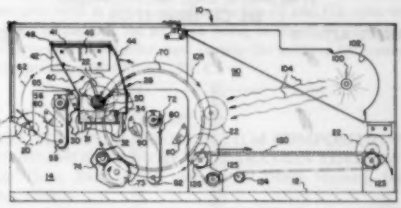
raising the spindle and discs above the pool and rotating the spindle at a rate of rotation substantially in excess of the rate of rotation during coating, to spin off excess coating from the films carried thereon,

moving said spindle out of the region of said pool into a region of ultraviolet curing light while continuing the rotation of said spindle and discs thereon,

maintaining said spindle in said ultraviolet light a time sufficient for substantial curing of said coating thereon, and

removing said spindle with said discs thereon from said ultraviolet region.

5. Apparatus for coating film discs on a disc carrying spindle for applying an ultraviolet curable liquid coating to the individual films carried on such discs, comprising:



means defining a pool of such coating,

means supporting such spindle for rotation with discs stacked thereon to a depth less than one-half the diameter of such discs so that only the lowermost films thereon are submerged in said pool,

spindle rotating means engageable with said spindle when said spindle is at said supporting means and operable to rotate said spindle slowly at said supporting means for applying such coating to said discs,

arm means elevating said spindle and discs above the level of said pool while maintaining engagement with said spindle rotating means and operable to rotate at a relatively high rate of speed for removing excess coating,

an ultraviolet curing lamp spaced from said pool and providing an ultravilet curing region,

said arm means being operable to move said spindle into said curing region while maintaining engagement with said rotating means for curing by ultraviolet energy during continued rotation of said spindle.

4,447,469

PROCESS FOR FORMING SULFIDE LAYERS BY PHOTOCHEMICAL VAPOR DEPOSITION

John W. Peters, Malibu, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

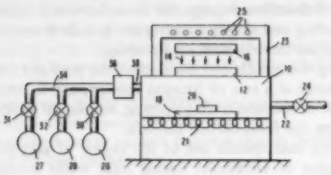
Filed Jun. 10, 1982, Ser. No. 387,086

Int. Cl.³ B05D *3/06;* **H01L** *21/205*

U.S. Cl. 427—54.1 **26 Claims**

1. A process for depositing a sulfide layer of a chosen element on the surface of a selected substrate which comprises: exposing said surface to a selected vapor phase reactant con-

taining said element in the presence of neutral, charge-free sulfur atoms to produce a chemical reaction between said



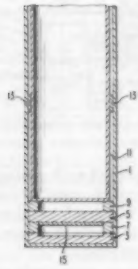
sulfur atoms and said reactant in a manner sufficient to form said sulfide layer on said surface of said substrate.

4,447,470

COMPOSITION CONTROL OF CSVPE HGCDTE

Robert E. Kay, Newport Beach, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Dec. 6, 1982, Ser. No. 447,082
Int. Cl.³ H01L *31/00*
U.S. Cl. 427—76 **7 Claims**



1. A method for growing a layer of HgCdTe on a CdTe substrate using a HgTe source and close-spaced vapor phase epitaxy, wherein close-spaced CdTe and HgTe are heated together at a constant processing temperature of between 520° C. and 625° C. for a fixed processing time of between ¼ hour and 4 hours.

4,447,471

METHOD OF TREATING THERMOPLASTIC SURFACES

Ronald A. Putt, Palatine, and Alan I. Attia, Arlington Heights, both of Ill., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 30, 1982, Ser. No. 454,786
Int. Cl.³ C23C *3/02*; H05K *3/18*
U.S. Cl. 427—98 **19 Claims**

1. The method of treating the surface of a body formed of polyphenylene sulfide, comprising the step of

subjecting the surface to a solution of bromine in an aqueous solution selected from the group consisting of an aqueous chloride solution and an aqueous bromide solution.

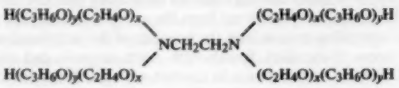
4,447,472

MAGNET WIRE COATING METHOD AND ARTICLE

Michael G. Minnick; James J. Connell, and Charles W. McGregor, all of Fort Wayne, Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Sep. 23, 1982, Ser. No. 421,753
Int. Cl.³ B05D *5/12*
U.S. Cl. 427—120 **6 Claims**

1. A method of improving the physical and electrical properties of polymeric insulation coated magnet wire comprising preparing a coating composition by mixing about 0.01% to about 5% by weight of non-ionic surfactant having the formula:



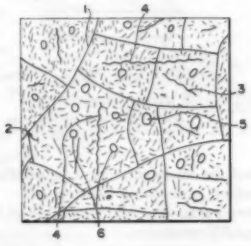
where x and y are so constituted as to result in a weight average molecular weight of 2,700 to 16,000 with x groups representing 10% to 80% of the total molecular weight, with an organic solvent solution of polymer containing hydroxyl functionality, applying said surfactant containing solution to a magnetic wire substrate, and drying and curing the coated substrate to produce a coated magnet wire with improved concentricity and smoothness.

4,447,473

METHOD OF PRODUCING DECORATIVE OBJECTS

Toru Mashida, 26-16, Miyamae 5-chome, and Sumeo Matsushita, 47-17, Izumi 3-chome, both of Suginami-ku, Tokyo, Japan

Filed Oct. 29, 1982, Ser. No. 437,532
Claims priority, application Japan, Nov. 6, 1981, 56-177112
Int. Cl.³ B05D *5/02*
U.S. Cl. 427—162 **4 Claims**



1. A method of producing decorative objects comprising the steps of forming a metal thin film on glazed and baked surface of a base body and treating the base body at high temperature in oxygen atmosphere, wherein the high temperature treatment causes oxidation of the thin film applied directly to the glazed and baked surface and the glazed and baked surface comes to a semi-fluid state to provide a surface with a form of fine ruggedness or unevenness, whereby a light-interference surface layer showing an esthetic pattern is formed.

4,447,474

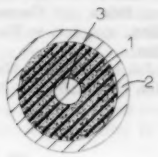
METHOD OF SELECTIVELY TINTING SOFT CONTACT LENSES

Charles W. Neefe, P.O. Box 429, 811 Scurry St., Big Spring, Tex. 79720

Filed Aug. 30, 1982, Ser. No. 412,872
Int. Cl.³ B05D *1/28, 7/04*; G02B *3/00, 1/10*
U.S. Cl. 427—164 **5 Claims**

1. A method of coloring selected portions of a soft contact lens by the steps of providing an impervious lens support, substantially the size and shape of the contact lens to be colored, placing an absorbent dye carrier material of a size and shape equal to the lens area to be colored in the surface of the lens support, allowing a liquid colorant to be absorbed into the absorbent dye carrier material, providing an uncolored central circular pupil area and an uncolored peripheral area, placing the lens surface in contact with the surface of the lens support

and the dye carrier material, allowing the colorant present in the dye carrier material to be absorbed into the lens at the



selected lens area and chemically reacting the dye substance to render it insoluble and permanent.

4,447,475

PROCESS FOR COMPOSITE POLYMER BEADS

Frederick J. Lubbock, Beaumaris; Christopher C. K. Mok, Clayton, and Robert J. Eldridge, Moorabbin, all of Australia, assignors to ICI Australia Limited, Victoria and Commonwealth Scientific and Industries Research Organization, Campbell, both of, Australia

PCT No. PCT/AU80/00018, 371 Date Dec. 3, 1980, 102(e) Date Dec. 3, 1980, PCT Pub. No. WO80/02687, PCT Pub. Date Dec. 11, 1980

PCT Filed Jun. 2, 1980, Ser. No. 220,024

Int. Cl.³ B01J *13/02*; B05D *7/16*

U.S. Cl. 427—213.31 **10 Claims**

1. A process of incorporating non-polymeric magnetic particulate matter into a polymeric matrix so as to obtain composite particles or beads comprising the non-polymeric magnetic particulate matter coated or embedded in said matrix, said process comprising the steps of polymerizing while stirring a mixture of (1) a dispersion of the non-polymeric magnetic particulate matter in a medium comprising one or more vinyl monomers selected from the group consisting of styrene, substituted styrenes and vinyltoluenes, a polymeric dispersant selected from the group of copolymers consisting of styrene/2-vinylpyridine, styrene/4-vinylpyridine, styrene/vinyltrimethoxysilane and styrene/vinyltriethoxysilane, a cross-linking agent and a polymerization initiator, and (2) an aqueous phase containing a suspension stabilizer, to obtain said composite particles or beads and then separating said particles or beads from the polymerization medium; the weight ratio of non-polymeric magnetic particulate matter to the polymeric dispersant being in a range from 12:1 to 5:1; and the weight ratio of polymeric dispersant to vinyl monomers being in a range from 1:5 to 1:20.

4,447,476

PROCESS FOR STABILIZING DEHYDRATED MAGNESIUM CHLORIDE AGAINST REHYDRATION

Franz J. Gattys, Neu-Isenburg, Fed. Rep. of Germany, assignor to F. J. Gattys Ingenierbüro, Neu-Isenburg, Fed. Rep. of Germany

Filed May 3, 1982, Ser. No. 374,109

Claims priority, application Fed. Rep. of Germany, May 4, 1981, 3117542

Int. Cl.³ B05D *7/00*

U.S. Cl. 427—215 **6 Claims**

1. A process for stabilizing dehydrated magnesium chloride against hydration, characterized by one of granulating and pelletizing the dehydrated magnesium chloride, providing the one of granulated and pelletized magnesium chloride with a coating of a material having a high degree of affinity for water, carrying out the coating operation using magnesium oxide, feeding the magnesium oxide into a granulator as a dry partially hydroxylated powder and completely hydroxylating the magnesium oxide during the granulation by adding water.

4,447,477

METHOD FOR THE PRODUCTION OF CORROSION-INHIBITING COATINGS ON METALLIC SURFACES

Heinrich Deibig, Frankfurt am Main, and Klaus Wollmann, Limburg, both of Fed. Rep. of Germany, assignors to Battelle-Institut e.V., Frankfurt am Main, Fed. Rep. of Germany

PCT No. PCT/EP82/00131, 371 Date Dec. 29, 1982, 102(e) Date Dec. 29, 1982, PCT Pub. No. WO83/00105, PCT Pub. Date Jan. 20, 1983

PCT Filed Jun. 24, 1982, Ser. No. 459,693

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1981, 3125113

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—388.3 **4 Claims**

1. Method for the production of corrosion inhibiting coating or pretreated metallic surfaces comprising applying a mixture of (i) 50 to 95 weight percent, based upon the total weight of the mixture, of a monomeric phenol, (ii) a low molecular condensation product of formaldehyde together with ammonia or an amine, and (iii) 0.1 to 10 weight percent, based upon the total weight of the mixture, of a wetting agent, which is chemical reactive with at least one of materials (i) and (ii), onto the surface to be coated, the mixture being in the form of a solution, dispersion or powder, and curing the mixture by heating to a temperature of 100° to 250° C.

4,447,478

NOVEL FLUOROELASTOMER FILM COMPOSITIONS AND METHOD FOR THE PREPARATION THEREOF

Donald Close, Stow, Ohio, assignor to David Hudson, Inc., Stow, Ohio

Division of Ser. No. 178,895, Aug. 18, 1980, abandoned. This application May 28, 1982, Ser. No. 383,343

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—407.1 **5 Claims**

1. A method for coating a substrate with fluoroelastomer film including the steps of:

coating the substrate with a film of an amine-derived curative selected from the group consisting of polyamine and polyamide adducts of epoxy resins, and blends of fatty amidoamine resins with polyamide adducts of epoxy resins;

applying a fluoroelastomer gum solution to said curative coated substrate; and

evaporating the solvent from said solution sufficiently to leave the film adhered to said curative coated substrate.

4,447,479

PLASTICS SHEET MATERIAL AND ARTICLES PRODUCED THEREFROM

Peter Harrison, Wakefield, and Thomas N. Gaunt, Leeds, both of England, assignors to Plastona (John Waddington) Ltd., Leeds, England

Continuation of Ser. No. 948,421, Oct. 4, 1978, abandoned, which is a continuation of Ser. No. 842,145, Oct. 14, 1977, abandoned, which is a continuation of Ser. No. 682,863, May 3, 1976, abandoned. This application Oct. 28, 1980, Ser. No. 201,557

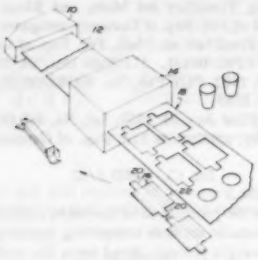
Claims priority, application United Kingdom, May 8, 1975, 19469/75; Jun. 7, 1975, 24533/75; Jun. 7, 1975, 24534/75; Sep. 9, 1975, 36946/75; Nov. 29, 1975, 49150/75

Int. Cl.³ B32B *27/32*; B65D *5/00*

U.S. Cl. 428—35 **26 Claims**

1. A cardboard-like material free of styrene resins and elastomers that retains its dead-fold characteristics manufactured by compounding 5–70 parts by weight of inorganic particulate material with 95 to 30 parts by weight of polyolefin resin selected from polypropylene-ethylene sequential copolymer; polypropylene-ethylene random copolymer; or any mixture of these, the compounding being carried out essentially by mechanical working to generate heat, and to disperse the inor-

ganic material evenly throughout the resin so as to produce a molten mass of uniform consistency having a melt flow index



of between 0.55 and 2.2 cc/10 minutes at 230° C. under a load of 2.16 Kg and subsequently converting the mass into the sheet in a thickness of 0.1–1.2 mm by extrusion or calendering.

4,447,480

SHRINKABLE FILM FOR POULTRY BAGS

Stanley Lustig, Park Forest; Jeffrey M. Schuetz, Downers Grove, and Stephen J. Vicik, Darien, all of Ill., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 1, 1982, Ser. No. 445,941

Int. Cl.³ A21D *10/02;* **C08L** *23/04;* **B65D** *33/00*

U.S. Cl. 428—35 **33 Claims**

1. A heat-shrinkable film, suitable for use in fabricating bags for packaging frozen poultry, comprising a mixture of between about 80 and about 95 percent by weight of an ethylene-vinyl acetate copolymer having a vinyl acetate content of from at least about 1.7 to about 4.5 percent by weight, based on the weight of said ethylene-vinyl acetate copolymer, and having a melt index of from at least about 0.15 to about 0.35 decigram per minute; and between about 5 and about 20 percent by weight, based on the weight of said film, of a polyethylene material selected from the group consisting of:

(a) low pressure-high density polyethylene having a melt index of between about 0.15 and about 0.70 decigram per minute, and a density of between about 0.94 and about 0.96 gram per cubic centimeter, and

(b) low pressure-low density polyethylene having a melt index of between about 0.3 and 3.0 decigrams per minute, and a density of between about 0.915 and about 0.925 gram per cubic centimeter.

18. A resin mixture comprising between about 80 and about 95 percent by weight of an ethylene-vinyl acetate copolymer having a vinyl acetate content of from at least about 1.7 to about 4.5 percent by weight, based on the weight of said ethylene-vinyl acetate copolymer, and having a melt index of from about 0.15 to about 0.35 decigram per minute; and between about 5 and about 20 percent by weight, based on the weight of said resin mixture, of a polyethylene material selected from the group consisting of:

(a) low pressure-high density polyethylene having a melt index of between about 0.15 and about 0.70 decigram per minute, and a density of between about 0.94 and about 0.96 gram per cubic centimeter, and

(b) low pressure-low density polyethylene having a melt index of between about 0.3 and about 3.0 decigrams per minute, and a density of between about 0.915 and about 0.925 gram per cubic centimeter.

4,447,481

PAPER SHEETS HAVING RECESSED PRESSURE-SENSITIVE GLUED EDGE WITH A REMOVABLE STRIP

Albert E. Holmberg, Edina, and Thomas A. Holmberg, Richfield, both of Minn., assignors to The Holmberg Company, Minneapolis, Minn.

Filed Jul. 11, 1983, Ser. No. 512,326

Int. Cl.³ B32B *3/02, 29/00*

U.S. Cl. 428—40 **6 Claims**

1. A paper sheet comprising,

an attachment marginal edge portion,

a recess formed along said attachment edge portion having a predetermined depth,

a layer of non-drying, pressure-sensitive adhesive applied only in the recessed marginal edge portion,

a protective strip removably applied to the layer of adhesive in said recess,

the combined thickness of the adhesive and protective strip being no greater than the depth of the recess so that the thickness of the attachment marginal edge portion of the paper sheet is no thicker than the remaining portion of the sheet to permit processing of the sheet through a conventional processing operation such as printing and copying in a conventional manner.

4,447,482

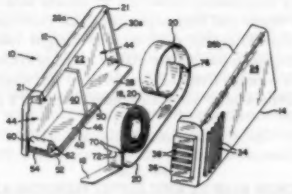
WOUND CLOSURE TAPE AND APPLICATOR THEREFOR

Bert D. Heinzelman, North Bergen, N.J.; Douglas M. Spranger; Malcolm J. Brookes, both of New York, N.Y., and John E. Kuphal, West Linn, Oreg., assignors to Shur Medical Corporation, Beaverton, Oreg.

Continuation-in-part of Ser. No. 341,487, Jan. 21, 1982, abandoned. This application Dec. 29, 1982, Ser. No. 452,749

Int. Cl.³ A61F *13/00;* **B32B** *35/00*

U.S. Cl. 428—42 **9 Claims**



1. A sterile wound closure adhesive tape product for use with a tape applicator, said tape product comprising:

a single strip of surgical tape having a pressure sensitive adhesive coating on one surface and a releasable backing strip covering the adhesive-coated surface,

said strip of tape being transversely perforated at regular intervals along its length to subdivide the strip into joined tape segments separable along the perforations without the aid of a cutting device upon the application of a substantial tensile force at said perforations, the length of each segment being substantially greater than its width,

said releasable backing strip being continuous and imperforate throughout its length,

said tape and backing strip being wound together into a supply roll for installation in an applicator,

said strip of tape but not said backing strip including a pair of opposed notches one at each of the opposite marginal

edges of said tape aligned with the perforations dividing said tape segments to provide a visual indicator of an end of each segment and an aid to separation of segments from the supply roll upon application of said tensile force,

said strip of tape being slightly narrower than said backing strip and being positioned on said backing strip such that both marginal edge portions of said backing strip extend slightly laterally outwardly beyond the corresponding marginal edge portions of said tape strip,

said supply roll being preset to cause said backing strip to self-coil when unconstrained after its release from said strip of tape,

said perforations being arranged to provide sufficient tensile strength at the interconnections between tape segments such that application of a segment to a skin surface under sufficient tension from the supply roll to close a laceration of such surface does not separate the applied segment from the roll .

7. A blade-less, disposable surgical tape applicator system comprising in combination:

a casing sized to fit within the palm of the hand of a user and partitioned internally to define a tape supply chamber and a waste liner storage chamber,

a tape outlet slot at a lower forward corner of said casing leading from said supply chamber and formed by converging wall portions of said casing,

a rigid internal guide surface spaced inwardly of said slot within said casing at said corner and defining with said converging wall portions divergent guide paths including a tape path leading from the supply chamber to said outlet slot and a waste liner path leading from the supply chamber toward said storage chamber,

internal partition means extending along and spaced from a bottom wall of said casing rearwardly of said guide surface to define with said bottom wall a waste liner passage as a continuation of said liner path, said passage communicating at opposite ends with said supply chamber and said storage chamber,

a supply roll of liner-backed sterile surgical adhesive tape loosely positioned within said supply chamber for centerless rotation therein, said tape, but not said liner, being divided at regular intervals along its length into connected segments by transverse perforations terminating at opposed marginal edge notches providing visual indications of the divisions between segments and a focus for tensile separating force applied across said perforations to facilitate separation of each segment from said roll,

an unlined leader portion of said tape extending from said roll across said internal guide surface and along said tape path through said outlet slot,

a leader portion of said liner extending with said tape across said guide surface and thence diverging from said tape along said liner path and into said liner passage,

said outlet slot, guide surface and divergent paths being operable such that as said tape leader is withdrawn through said slot said liner is separated therefrom and propelled along said passage into said storage chamber,

said roll being preset in roll form to an extent such that as said liner enters said storage chamber it self-coils independently of the shape of said chamber,

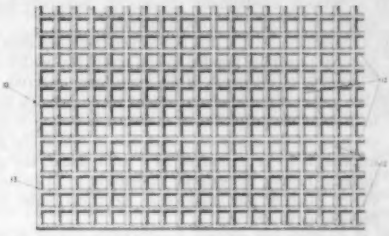
the tensile strength of said perforated tape portions being such that sufficient tension can be applied to the tape across a perforated tape portion during application of a tape segment to a skin surface to close a wound without separating the applied segment from the roll, and being such that application of a higher tension to the tape across a perforated tape portion separates the applied segment from the roll without the aid of any cutting means,

said casing including a resilient depressible wall portion depressible by selectively applied hand pressure and cooperative with said guide surface to apply a controlled variable tension to the tape including a low tension for closing a wound and thereafter a higher tension for separating an applied segment from the roll without the aid of any cutting means.

4,447,483
RETICULAR NEEDLEWORK FABRIC

William T. Graham, Verona, and Gregory Wenkman, Dane, both of Wis., assignors to W. T. Rogers Co., Madison, Wis.

Filed Sep. 16, 1982, Ser. No. 418,992
Int. Cl.³ B32B *5/12*
U.S. Cl. 428—105 9 Claims



1. A reticular needlework fabric (**10**, **16**) adapted to receive needlework yarns, comprising a unitarily molded network of strands (**12**) having

(a) a plurality of spaced strands (**12**) extending parallel to a first axis;

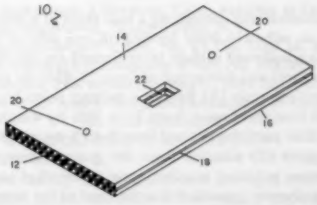
(b) a plurality of spaced strands (**12**) extending parallel to a second axis; and

(c) a selected number of marker strands (**14**) included among the strands (**12**) parallel to at least one axis, separated from each other by a selected number of strands (**12**) and having molded-in features rendering them visually distinguishable from the remaining strands (**12**), such features being adapted to be substantially obscured after application of the needlework yarns.

4,447,484
FLAME-RESISTANT VINYL FOAM GASKET AND METHOD OF PREPARATION

David K. Slosberg, Atlanta, and Gilbert S. Nowell, Marrietta, both of Ga., assignors to Compo Industries, Inc., Waltham, Mass.

Filed Mar. 25, 1983, Ser. No. 478,788
Int. Cl.³ B32B *3/10, 5/28, 31/26*
U.S. Cl. 428—137 21 Claims



1. A method of preparing a flame-resistant vinyl-foam sheet material, which method comprises:

(a) forming a layer of an expandable, liquid-vinyl plastisol composition;

(b) placing a fibrous tissue sheet material, having interstices therein, onto the top surface of the layer of the liquid plastisol composition, the tissue sheet material wetted by the plastisol composition, and permitting the liquid plasti-

sol composition to penetrate the interstices of the tissue sheet material and the tissue sheet material to settle to a desired depth within the coating layer; and

(c) heating the layer of the plastisol composition to a temperature to gel, expand and fuse the plastisol composition, to provide a flexible, tissue-reinforced, vinyl-foam sheet material having the tissue sheet material integrally positioned and secured within the foam layer.

18. An air draft gasket sheet material suitable for use as an open flame resistant draft shield in electrical plug and switch outlets, which gasket sheet material consists essentially of:

(a) a flexible, substantially closed-cell, integrally-formed, single vinyl resin foam sheet material;

(b) a dimensional stable thin nonwoven thin glass fiber sheet material integrally bonded to and positioned within about 20 to 80% of the depth of the vinyl foam material;

(c) the gasket material characterized by an opening formed to fit about the projection of an electrical switch or electrical plug of the electrical outlet box in which the gasket material is to be employed as a draft shield, the gasket material having the exterior dimension to fit behind the switch plate or plut plate of an electrical outlet box to prevent air drafts; and

(d) the gasket material characterized by meeting the flame test standards of the Canadian Standards Association C.22.2 No. 18 4.1.4.

4,447,485

ADHESIVE TAPE AND PROCESS FOR ITS PRODUCTION

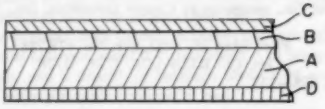
Toshiyuki Aritake, Nagahama, Japan, assignor to Mitsubishi Plastics Industries Limited, Tokyo, Japan

Filed Jul. 12, 1982, Ser. No. 397,237

Claims priority, application Japan, Aug. 4, 1981, 56-122294; Aug. 10, 1981, 56-125129; Oct. 5, 1981, 56-158439; Nov. 30, 1981, 56-192052

Int. Cl.³ B32B *5/16*

U.S. Cl. 428—144 **8 Claims**



1. An adhesive tape comprising a base sheet of a polypropylene resin, an adhesive layer formed on one side of the base sheet and a roughened surface layer formed on the other side of the base sheet and composed of from 25–85% by weight of a polypropylene resin (X) having a melting point lower than that of said base sheet resin, from 10 to 50% by weight of fine inorganic filler particles (Y) and from 5–45% by weight of one or more resins (Z) selected from the group consisting of a methylpentene polymer, a polystyrene, a polyalkyl methacrylate and a polyester, provided that the total of the components (X), (Y) and (Z) is always 100% by weight and the amount of the component (Z) is not more than the amount of the component (X), and the relative specular glossiness of the roughened surface layer is not more than 30%, characterized in that said roughened surface layer has a thickness of not more than the maximum particle diameter of said fine inorganic filler particles and is substantially free from voids and cracks, and the total percent light transmittance of the adhesive tape is at least 90%.

4,447,486

SURFACE-SEALED MOLDINGS OF CELLULAR POLYURETHANE ELASTOMERS AND A PROCESS FOR THEIR PRODUCTION

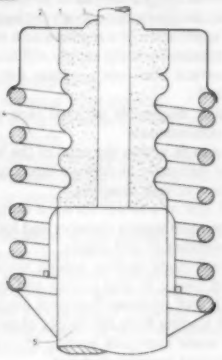
Hans-Georg Hoppe, Leichlingen, and Paul Henrichs, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 171,211, Jul. 22, 1980, abandoned. This application Sep. 21, 1981, Ser. No. 303,754

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1979, 2931469

Int. Cl.³ B32B *3/26, 27/40*

U.S. Cl. 428—318.6 **4 Claims**



1. A molding of an at least partly open-cell polyurethane elastomer having a substantially homogeneous density profile and a density of from 0.3 to 0.8 g/cc, characterized in that its surface is sealed with a tight, nonporous skin of polyurethane or polyurethane urea having a thickness of from 0.05 to 1 mm.

4,447,487

HEAT-SENSITIVE RECORDING PAPERS

Masakazu Maekawa, and Hiroharu Matsukawa, both of Shizuoka, Japan, assignors to Fuji Photo Film Company, Limited, Kanagawa, Japan

Filed Oct. 22, 1982, Ser. No. 436,081

Claims priority, application Japan, Oct. 22, 1981, 56-169034

Int. Cl.³ B41M *5/18*

U.S. Cl. 346—200 **8 Claims**

1. A heat-sensitive recording paper, comprising:

a support base comprised of paper having a density of 0.9 g/cm³ or less; and

a heat-sensitive recording layer coated on a surface of the support base, the surface of the coated layer having an optical contact ratio 7% or more.

4,447,488

SHAPED ARTICLE OF A SYNTHETIC RESIN AND/OR NATURAL RUBBER AND PROCESS FOR THE PRODUCTION THEREOF

Manfred Simm, Troisdorf; Karl-Heinz Spiess, Much, and Richard Weiss, Troisdorf, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 150,293, May 16, 1980, abandoned. This application Jan. 21, 1982, Ser. No. 341,166

Claims priority, application Fed. Rep. of Germany, May 31, 1979, 2922089

Int. Cl.³ B32B *7/02, 25/04*

U.S. Cl. 428—213 **15 Claims**

1. A sheet of a synthetic resin or natural rubber, provided with fillers and additives other than vulcanization accelerators,

which comprises a sheet of said synthetic resin or natural rubber containing 3 to 95% by weight of at least one polymeric component which is weldable by heat and/or by solvents or swelling agents, and which is crosslinkable by high-energy radiation, said polymeric component being provided in a homogeneous distribution within the sheet and being crosslinked, at least partially, over a selected portion of the thickness of said sheet starting from one exposed side surface of said sheet that has been subjected to high-energy radiation and extending into the interior of said sheet, said polymeric component in said

selected portion being sufficiently crosslinked to provide greater weather resistance and tear strength to said portion and to lose its weldability, and the polymeric component, in that portion of the sheet including another exposed side surface, which has not been crosslinked by being subjected to high-energy radiation, remaining weldable by heat and/or by solvents or swelling agents to provide weldability to said another exposed side surface of said sheet, whereby a sheet having an exposed side surface with greater weather resistance and another exposed side surface that remains weldable is provided.

4,447,489

FILAMENT YARNS OF MULTICOMPONENT FIBERS AND UTILIZATION THEREFOR IN TEXTILE FABRICS

Heinz Linhart, Erlenbach; Reiner Modtler, and Eberhard Kratzsch, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Sep. 23, 1981, Ser. No. 304,907

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1980, 3035862

Int. Cl.³ D03D *3/00*

U.S. Cl. 428—225 **22 Claims**

1. A process for the production of filament yarns of multicomponent fibers of the matrix/segment type which comprises falsetwist-texturing a plurality of multicomponent fibers containing one component in the form of segments having varying deniers with a matrix component to produce a yarn, wherein the ratio of low denier segments to high denier segments is between about 1:1.6 and 1:30 and the weight ratio of low denier segments to high denier segments in the yarn is between about 25:75 and 75:25, at a setting temperature which is at least equal to the melting temperature of the matrix component, whereby the fibers are fused together by softening of matrix component in spots, zones or over nearly the entire length involving the entire or part of the cross-section of the yarn.

4,447,490

LAMINATED MINERAL FIBRE MAT AND PROCESSES FOR ITS PRODUCTION

Heinz Ventker, Emsdetten, and Fred Wendlinger, Mannheim, both of Fed. Rep. of Germany, assignors to Rheinhold & Mahla Dammstoffe GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Nov. 26, 1982, Ser. No. 444,918

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1981, 3147316

Int. Cl.³ B32B *5/08, 5/14, 5/24, 17/06, 33/00*

U.S. Cl. 428—285 **10 Claims**

1. A laminated mineral fibre mat comprising substantially randomly arranged mineral fibres which are held together by organic binders where they cross one another and which form the mat and of a lamination adhering to the mat by means of an organic adhesive, characterised in that a plane of substantially randomly arranged mineral fibers substantially free from organic binder is provided in the mat parallel to and in the vicinity of the lamination.

6. A process for the production of the mineral fibre mat claimed in claim 1, characterised in that binder is removed from the mat of substantially randomly arranged mineral fibers in a plane parallel and adjacent to the surface to be laminated and thereafter the lamination is applied and adhered to the binder-free surface of the mat through use of an adhesive.

4,447,491

NETWORK OF BONDED EXPANDED POLYSTYRENE BEADS HAVING CHEMICALLY DELAMINATED VERMICULITE IMPREGNANT

John A. Bradbury; Reuben Rowlands, both of Runcorn, and James W. Tipping, Liverpool, all of England, assignors to Imperial Chemical Industries Plc, London, England

Filed May 11, 1982, Ser. No. 387,754

Claims priority, application United Kingdom, Jun. 17, 1981, 8118638

Int. Cl.³ B32B *3/10, 19/02, 31/00*

U.S. Cl. 428—304.4 **14 Claims**

1. A fire-resistant material comprising a network of bonded, expanded polystyrene beads and having an inorganic impregnant selected from chemically delaminated vermiculite and mixtures containing same incorporated in the interstices in the network to provide throughout the material a reticulated impregnant structure which is retained upon destruction of the network of bonded, expanded polystyrene beads in a fire.

4,447,492

ARTICLES HAVING AN ELECTRICALLY CONDUCTIVE SURFACE

James P. McKaveney, Claremont, Calif., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 42,374, May 24, 1979, abandoned, which is a continuation of Ser. No. 853,653, Nov. 21, 1977, abandoned. This application Aug. 7, 1981, Ser. No. 290,909 The portion of the term of this patent subsequent to Apr. 8, 1997, has been disclaimed.

Int. Cl.³ B32B *5/16, 15/08, 27/14*

U.S. Cl. 428—328 **22 Claims**

1. An electrically conductive article having a non-conductive substrate which substrate has at least a portion of the surface thereof coated with a composition comprising about 3 to about 80 percent by weight of a binder and about 20 to about 97 percent by weight of a filler, the filler comprising particles, having an average particle size of from about 2 to about 10 microns, of a refractory ferroalloy selected from the group consisting of ferromanganese silicon, ferromanganese, ferromolybdenum, ferrosilicon, ferrochrome, ferrovanadium, ferrozirconium, ferrotitanium, ferrotungsten, ferroboron, ferrophosphorus, iron carbide, and mixtures thereof.

4,447,493

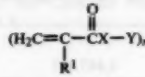
VIBRATION-DAMPING CONSTRAINED-LAYER CONSTRUCTIONS

William A. Driscoll, Woodbury; Steven M. Heilmann, North St. Paul, and Jerald K. Rasmussen, Stillwater, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 26, 1982, Ser. No. 401,918
Int. Cl.³ B32B *15/08, 27/38*
U.S. Cl. 428—332 **8 Claims**

1. A constrained-layer construction for damping vibrations in solid articles at a temperature of at least 50° C., said construction comprising a substrate having a stiffness relative to stainles steel of at least 0.40 and bearing a continuous layer of a copolymer having a thickness of 0.01 mm to 100 mm, said copolymer having a storage modulus of at least 1×10^7 dynes/cm^2 and a loss tangent above 0.5 at 100° C. and 1000 Hz, said copolymer being the reaction product of a mixture comprising:

(a) 25 to 75 weight percent of an acryloyl or methacryloyl derivative of at least one oligomer, said oligomer having a glass transition temperature of less than 25° C. and a molecular weight per oligomer of 600 to 20,000, said oligomer having the formula



wherein:

R is the organic residue of a nucleophilic group-substituted oligomer having a molecular weight of 600 to 20,000, glass transition temperature of less than 25° C., and n hydroxyl, amino or thiol groups, said nucleophilic group-substituted oligomer being selected from the group consisting of polyoxyalkylene, poly(perfluorooxyalkylene), polyester, polyolefin, polyacrylate, polyamide, and polysiloxane oligomers;

n is the valence of R having a value of at least one;

Y is selected from —O—, —S— and

in which R^2 is (a) hydrogen, or (b) a hydrocarbyl group selected from (1) an alkyl or cycloalkyl group having 1 to 12 carbon atoms optionally substituted by cyano, hydrogen or alkoxy group having 1 to 4 carbon atoms, or (2) an aryl or aralkyl group having 6 to 12 carbon atoms;

X is a divalent connecting group; and

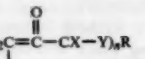
R^1 is hydrogen or methyl; and

(b) 75 to 25 weight percent of a copolymerizable monomer whose homopolymer has a glass transition temperature of at least 50° C.

2. A process for damping the vibration of a vibrating solid article at temperatures above 50° C., said process comprising the steps:

(a) providing a constrained-layer construction, said construction comprising at least one substrate having a stiffness relative to stainles steel of at least 0.40 coated with at least one continuous layer of a viscoelastic copolymer having a thickness of 0.01 mm to 100 mm, said copolymer having a storage modulus of at least 1×10^7 dynes/cm^2 and a loss tangent above 0.5 to 100° C. and 1000 Hz, said copolymer being the reaction product of a mixture comprising:

(1) 25 to 75 percent of an acryloylated or methacryloylated oligomer having a glass transition temperature of less than 25° C. and a molecular weight of 600 to 20,000, said oligomer having the formula



wherein:

R is the organic residue of a nucelophilic group-substituted oligomer having a molecular weight of 600 to 20,000, glass transition temperature of less than 25° C., and n hydroxyl, amino or thiol groups, said nucleophilic group-substituted oligomer being selected from the group consisting of polyoxyalkylene, poly(perfluorooxyalkylene), polyester, polyolefin, polyacrylate, polyamide, and polysiloxane oligomers;

n is the valence of R having a value of at least one;

Y is selected from —O—, —S— and

in which R^2 is (a) hydrogen, or (b) a hydrocarbyl group selected from (1) an alkyl or cycloalkyl group having 1 to 12 carbon atoms optionally substituted by cyano, hydrogen or alkoxy group having 1 to 4 carbon atoms, or (2) an aryl or aralkyl group having 6 to 12 carbon atoms;

X is a divalent connecting group; and

R^1 is hydrogen or methyl; and

(2) 75 to 25 percent by weight of a copolymerizable monomer whose homopolymer has a glass transition temperature of at least 50° C., and

(3) an effective amount of a free-radical generator, and

(b) affixing said constrained-layer construction onto said solid article.

4,447,494

ORIENTED MULTILAYER HEAT SEALABLE PACKAGING FILM

John R. Wagner, Jr., Rochester, and Carl C. Hein, Pittsford, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,427
Int. Cl.³ B32B *27/00;* **C09J** *7/02*
U.S. Cl. 428—349 **17 Claims**

1. A multilayer heat sealable structure comprising:

(a) a substrate comprising a polyolefin film;

(b) a layer on at least one surface of (a), said layer consisting essentially of a random copolymer of ethylene and propylene, said copolymer containing from about 0.5 to about 6% by weight of ethylene;

(c) a primer coating between layers (b) and (d) on at least one of said layer (b); and

(d) a heat sealable layer on said coating (c), said heat sealable layer comprising a vinylidene chloride copolymer containing at least 50% by weight of vinylidene chloride.

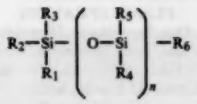
4,447,495

ADHESIVE PROCESS

Edward J. Engle, III, Wilmington, Del., assignor to Hercules, Incorporated, Wilmington, Del.

Filed Mar. 8, 1983, Ser. No. 473,292
Int. Cl.³ B32B *17/10, 5/16*
U.S. Cl. 428—429 **10 Claims**

7. A polymer coated siliceous material formed by admixing the siliceous material, an azidosilane coupling agent, the polymer, and an organosilicon compound having the formula



where n is an integer from 0 to 4 and where R_1, R_2, R_3, R_4, R_5 and R_6, which may be the same or different, are selected from the group consisting of lower alkyl, aralkyl, or lower akloxides and then heating the admixture at a temperature and for a time sufficient to decompose the azide group of the azidosilane coupling agent.

4,447,496

ORGANOTIN SURFACE TREATMENT AND INTERLEAVING MATERIAL FOR GLASS SHEETS

Helmut Franz, Pittsburgh; Paul F. Duffer, Creighton, and Joseph D. Kelly, Cheswick, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 229,046, Jan. 28, 1981, Pat. No. 4,360,544, which is a continuation-in-part of Ser. No. 83,084, Oct. 9, 1979, Pat. No. 4,263,371. This application Jul. 23, 1982, Ser. No. 401,179

The portion of the term of this patent subsequent to Apr. 21, 1998, has been disclaimed.

Int. Cl.³ B32B *17/06, 17/10*

U.S. Cl. 428—432 **6 Claims**

1. An article of manufacture comprising:

a. a plurality of glass sheets, the surfaces of which have been treated with an organotin compound at a temperature insufficient to thermally decompose said organotin compound; and

b. an interleaving material interspersed between said glass sheets.

4,447,497

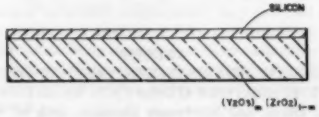
CVD PROCESS FOR PRODUCING MONOCRYSTALLINE SILICON-ON-CUBIC ZIRCONIA AND ARTICLE PRODUCED THEREBY

Harold M. Manasevit, Anaheim, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 3, 1982, Ser. No. 373,929

Int. Cl.³ C30B *23/06, 25/18;* **H01L** *21/205*

U.S. Cl. 428—446 **24 Claims**



1. A method for producing monocrystalline semiconductor-on-insulator structures comprising:

removing sufficient oxygen from the surface of a polished insulating substrate of cubic zirconia by subjecting at least said surface to a heat treatment of approximately 1150°–1400° C. for a time in order to stabilize the surface of the substrate so that a semiconductor layer can be deposited thereon;

lowering the temperature of said substrate to below 1075° C.; and

depositing a thin monocrystalline layer of a semiconductor material on the stabilized surface of the substrate.

4,447,498

USE OF ORGANOPOLYSILOXANES IN THE MANUFACTURE OF PAPER-COATED PLASTER BOARDS

Hans-Ferdi Fink; Götz Koerner, and Edmund Luksch, all of Essen, Fed. Rep. of Germany, assignors to Th.Goldschmidt AG, Essen, Fed. Rep. of Germany

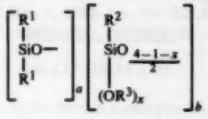
Filed Dec. 1, 1982, Ser. No. 445,682

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1981, 3149791

Int. Cl.³ B32B *15/12, 31/12*

U.S. Cl. 428—447 **4 Claims**

2. In a process for the preparation of paperlaminated plaster boards wherein plaster paste is spread on a lower paper sheet and the surface of the paste layer is covered with a second paper sheet, the laminate is molded into flat panels and cured at elevated temperatures, the improvement which comprises first treating the paper sheets with a hydrophobizing agent to decrease the water absorbency of the paper, the agent being an an organopolysiloxane having the formula



in which

R^1 is an alkyl or aryl radical, at least 80% of the R^1 radicals being alkyl radicals,

R^2 is an alkyl radical or the R^4Z radical, at least ⅓ of the R^2 radicals being R^4Z radicals, in which

R^4 is a difunctional hydrocarbon radical,

Z is $-NH_2$, $-NH(CH_2)_c-NH_2$, $-NH(CH_2)_cNH(CH_2)_cNH_2$, in which c is 2, 3, $-NHCONH_2$ radical, $-SH$, $-S_4-R^4-Si(OR^3)_3$, $-P(C_6H_5)_2$ or

R^3 is an alkyl radical with 1 to 4 carbon atoms, or a hydrogen radical,

a is not less than 4,

b/a is not less than 0.001, but not greater than 0.5, and

x is not less than 0.1, but not greater than 2, and then subjecting the treated paper to curing conditions.

4. Paper-laminated plaster board produced by the process of claim 2.

4,447,499

METHOD OF COATING SUBSTRATES WITH POLYDIORGANOSILOXANES HAVING LOWER ALKYL SUBSTITUENTS TO PROVIDE RELEASE COATINGS

Terence J. Swihart, Essexville, and Maris J. Ziemelis, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed May 9, 1983, Ser. No. 493,122

Int. Cl.³ B05D *3/06*

U.S. Cl. 428—447 **29 Claims**

1. A method for coating a substrate with a polydiorganosiloxane to provide a coating upon said substrate, said method comprising

(A) applying to said substrate a coating composition consisting essentially of

(1) 100 parts by weight of polydiorganosiloxane having a viscosity of from about 1.0×10^{-4} m^2/second to about 1.0×10^{-2} m^2/second, said polydiorganosiloxane being

selected from the group consisting of polydiorganosiloxanes having the formula $R_3SiO(MeQSiO)_x(Me_2SiO)_ySiR_3$, wherein Q is a radical selected from the group consisting of ethyl and propyl radicals, R is a radical selected from the group consisting of Q radicals, methyl radicals, and hydroxyl radicals, Me represents the methyl radical, x has an average value of 0 or more, and y has an average value of 0 or more, there being at least two radicals selected from Q radicals and hydroxyl radicals in the polydiorganosiloxane, and

(2) 0.1 to 10 parts by weight of an ultraviolet radiation photosensitizer soluble in said polydiorganosiloxane, and

(B) exposing the applied coating composition to an amount of ultraviolet radiation sufficient to cure said applied coating composition.

8. The method of claim **1** wherein the substrate is paper.

19. The method of claim **1** wherein the substrate is a polymeric film.

4,447,500

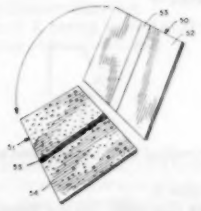
RELEASE COMPOSITIONS FOR ASPHALT ROOFING MATERIALS AND METHODS OF USE

John A. Ferris, 945 Meadow Crest Rd., LaGrange Park, Ill. 60525

Continuation-in-part of Ser. No. 403,342, Jul. 30, 1982, abandoned. This application Jul. 25, 1983, Ser. No. 516,926

Int. Cl.[3] **B05D** *3/02;* **B32B** *11/00;* **C08L** *91/00;* **C09D** *3/26*

U.S. Cl. 428—489 **12 Claims**



8. The method of treating a surface of an asphalt roofing sheet material preparatory to stacking or rolling to prevent adherence of the treated surface to another surface of the roofing material, comprising dissolving a mixture of cocamide MEA and stearamide MEA in water at an elevated temperature, said amides being present in proportions of from 30 to 70 parts by weight of cocamide MEA to 70 to 30 parts of stearamide MEA, said solution containing from 0.5 to 2.5 parts by weight of total amides per each 100 parts of water, cooling the solution to a temperature at which most of the amides are present as a dispersion of colloidal particles, applying said dispersion to the surface to be treated, and forming a dry coating thereon of said amide mixture.

9. The method of claim **8** in which said roofing material is asphalt shingles having adhesive asphalt seal strips on their upper sides and release tapes on their undersides positioned to mate with said seal strips when said shingles are stacked, said aqueous dispersion being applied to the upper surfaces of said release strips to form a release coating thereon.

10. The stackable asphalt shingles produced by the method of claim **9**.

4,447,501

CERAMIC BASED COMPOSITE MATERIAL FOR FLAME SPRAYING

Kitahara Shigeru, Ota; Isao Okane, Higashikurume; Katsuyuki Shirai, Meguro, and Tosio Morimura, Kawaguchi, all of Japan, assignors to National Research Institute for Metals and Showa Denko Kabushiki Kaisha, both of Tokyo, Japan

Filed Aug. 28, 1981, Ser. No. 297,118

Claims priority, application Japan, Sep. 29, 1980, 55-134221

Int. Cl.[3] **B22F** *1/02*

U.S. Cl. 428—570 **11 Claims**

1. A flame spraying composite material consisting of core particles which essentially consist of ZrO_2 and a deposited coating layer which is firmly bonded over the entire surface of the ZrO_2 particles by a chemical bond, wherein said deposited layer comprises a metal oxide and a metal which is a constituent of said metal oxide, an interface of said deposited layer with said ZrO_2 particles consisting of said metal oxide whch is a major constituent material, and an outer surface of said deposited layer which essentially consists of said metal.

7. A flame spraying composite material consisting of core particles which essentially consist of ZrO_2 and a deposited coating layer which is firmly bonded over the entire surface of the ZrO_2 particles by a chemical bond, wherein said deposited layer comprises a metal oxide and a metal which is a constituent of said metal oxide, and an interface of said deposited layer with said ZrO_2 particles which consists of said metal oxide, and an outer surface of said deposited layer only which consists of said metal, the concentration of said metal increasing continuously from the interface to the outer surface of said deposited coating layer.

4,447,502

BOTTLENECK FOIL

Klaus Sommerer, Hann. Münden, Fed. Rep. of Germany, assignor to Haendler & Natermann GmbH, Hann. Münden, Fed. Rep. of Germany

Filed Aug. 23, 1982, Ser. No. 410,810

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1981, 3137324

Int. Cl.[3] **B65D** *23/8, 65/38;* **B32B** *15/08*

U.S. Cl. 428—571 **11 Claims**

1. A bottleneck foil comprising an aluminum foil section coated on both sides with a protective layer, the protective layer comprising a mixture of

1 to 40% by weight of a binder which is not resistant to alkaline solutions and

60 to 99% by weight of a binder which is resistant to alkaline solutions.

4,447,503

SUPERALLOY COATING COMPOSITION WITH HIGH TEMPERATURE OXIDATION RESISTANCE

Louis E. Dardi, and Srinivasan Shankar, both of Muskegon, Mich., assignors to Howmet Turbine Components Corporation, Greenwich, Conn.

Continuation-in-part of Ser. No. 145,460, May 1, 1980, Pat. No. 4,339,509, and Ser. No. 67,097, Aug. 16, 1979, Pat. No. 4,313,760, which is a continuation-in-part of Ser. No. 43,146, May 29, 1979. This application Mar. 31, 1981, Ser. No. 249,502

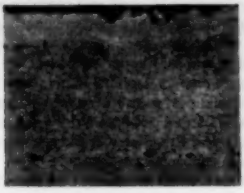
The portion of the term of this patent subsequent to Jul. 13, 1999, has been disclaimed.

Int. Cl.[3] **B32B** *15/04*

U.S. Cl. 428—632 **37 Claims**

1. In a nickel, cobalt, or iron base superalloy component, the improvement comprising a coating composition on said component consisting essentially by weight of from 6 to 30%

aluminum, 0.01 to 15% tantalum, 5 to 50% chromium, 0.1 to 10% manganese, up to 5% tungsten, up to 12% silicon, up to



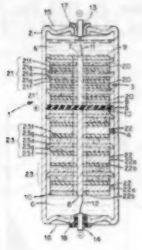
10% hafnium, and the balance selected from the group consisting of nickel, cobalt, and iron and combinations thereof.

4,447,504

ELECTROCHEMICAL CELL WITH TWO RATE BATTERY STACKS

Franz Goebel, Sudbury, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jan. 3, 1983, Ser. No. 455,090
Int. Cl.³ H01M *12/00, 4/36, 2/02, 2/08*
U.S. Cl. 429—9 **11 Claims**



1. An electrochemical cell comprising:
an elongated metal housing having first and second portions and an interior wall;
first and second spaced-apart elongated metal terminals within and along the direction of the housing; and
an electrochemical system contained within the housing and including an electrolytic solution within the housing with bi-directional passage between said first and second portions and a plurality of battery stack components exposed to the electrolytic solution and arranged in first and second battery stacks encircling the first and second elongated metal terminals, respectively, said first and second battery stacks and associated first and second elongated metal terminals being spaced apart from each other within the first and second portions, respectively, of the housing;
said first battery stack within said first portion of the housing comprising:
a first plurality of metal electrode structures of first thicknesses in direct physical contact with the first elongated metal terminal and spaced from the interior wall of the housing; and
a first plurality of carbon electrode structures of first thicknesses arranged in alternation with the first plurality of metal electrode structures and in direct physical contact with the interior wall of the housing and spaced from the first elongated metal terminal; and
said second battery stack within said second portion of the housing comprising:
a second plurality of metal electrode structures of second thicknesses in direct physical contact with the second elongated metal terminal and spaced from the interior wall of the housing; and
a second plurality of carbon electrode structures of second thicknesses arranged in alternation with the second plurality of metal electrode structures and in direct physical contact with the interior wall of the housing and spaced from the second elongated metal terminal;
said housing including first and second electrical terminals supported therein and electrically insulated therefrom;
first means electrically connecting the first elongated metal terminal with the first electrical terminal;
second means electrically connecting the second elongated metal terminal with the second electrical terminal; and
said metal housing serving as a common electrical terminal.

4,447,505

FUEL CELL ELECTRODE

Alain P. O. Blanchart, Balen, Belgium, assignor to Electrochemische Energieconversie, N.V., Mol, Belgium

Filed Dec. 1, 1981, Ser. No. 326,206
Claims priority, application Netherlands, Dec. 13, 1980, 8006774
Int. Cl.³ H01M *4/86*
U.S. Cl. 429—42 **14 Claims**

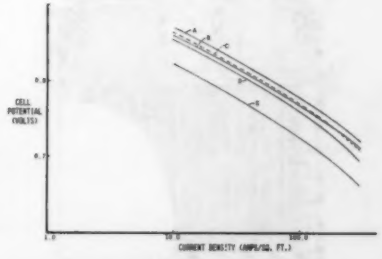
1. A fuel cell electrode having a catalytic layer composed of two separately prepared intimate mixtures of a noble metal on carbon, the first mixture comprising a noble metal on carbon having a relatively low specific surface area of less than 100 m^2g^{-1}, and the second mixture comprising a noble metal on carbon having a relatively high surface area of greater than 150 m^2g^{-1}, the amount by weight of noble metal in said second mixture being equal to or less than the amount by weight of nobel metal in said first mixture.

4,447,506

TERNARY FUEL CELL CATALYSTS CONTAINING PLATINUM, COBALT AND CHROMIUM

Francis J. Luczak, Glastonbury, and Douglas A. Landsman, West Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 17, 1983, Ser. No. 459,002
Int. Cl.³ H01M *4/92*
U.S. Cl. 429—44 **4 Claims**



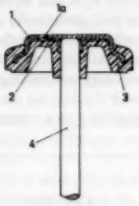
1. A fuel cell having an anode and a cathode with an electrolyte disposed therebetween, wherein the improvement comprises a ternary alloy cathode catalyst of platinum, cobalt, and chromium supported on an electrically conductive carbon-black, said catalyst having a catalytic activity for the electrochemical reduction of oxygen at least two and one-half times that of an unalloyed platinum catalyst supported on the same electrically conductive carbon-black.

4,447,507

CONTACT IN ALKALINE ELECTRIC CELLS

Javier A. Larranaga, Vitoria, Spain, assignor to Celaya, Emparanza Y Galdos S.A. (Cegasa), Vitoria, Spain

Filed Sep. 28, 1982, Ser. No. 426,202
Int. Cl.³ H01M 2/30
U.S. Cl. 429—54 3 Claims



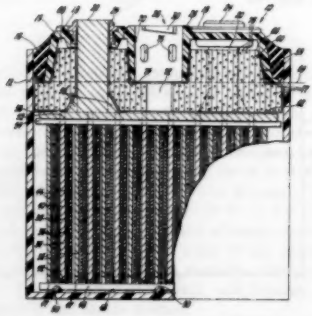
1. In an alkaline electric cell having a contact assembly therein, the improvement wherein said contact assembly comprises an inner metal disk and an outer metal disk arranged to engage one another in coaxial relation to form an exterior anode for the alkaline electric cell, said inner metal disk forming a cylindrical projection having a bore which is coaxial with said inner and said outer metal disks wherein said projection extends inwardly of the cell, a cell end cover of plastics material in which the edges of said inner and said outer metal disks are embedded, and a cylindrical collector rod arranged coaxially within the cell wherein one end of said rod is seated in the bore of said cylindrical projection in electrical contact with the inner circumference of said bore so that said electrical contact is maintained when said rod and said end cover including said projection are moved relative to one another over a certain distance in the axial direction.

4,447,508

REDUCED MAINTENANCE EXPLOSION DAMAGE RESISTANT STORAGE BATTERY

Henry E. Jensen, Lafayette Hill, Pa., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 309,639, Oct. 13, 1981. This application Apr. 28, 1983, Ser. No. 488,526
Int. Cl.³ H01M 10/34
U.S. Cl. 429—57 4 Claims



1. An explosion damage resistant reduced maintenance storage battery, comprising:

a case containing a plurality of negative plates and positive plates and a quantity of electrolytes

said case defining a first chamber between said negative and positive plates in an uppermost surface of said case;

a first strap member electrically connected to said plurality of positive plates, and a second strap member electrically connected to said plurality of negative plates;

a first post member electrically connected to said first strap member and passing through said chamber and said uppermost surface, and a second post member electrically connected to said second strap member and passing through said chamber and said uppermost surface;

a honeycomb member disposed in said first chamber and around said first post member and around said second post member and defining a second chamber substantially smaller than said first chamber between said honeycomb member and said uppermost surface;

said honeycomb member dividing said first chamber into a plurality of separated linearly extending gas chambers having lower ends below the surface of said electrolyte and having upper ends communicating with said second chamber;

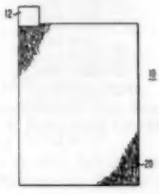
said case defining a vent opening through said uppermost surface communicating with said second chamber.

4,447,509

PRE-PLATED REACTIVE DIFFUSION-BONDED BATTERY ELECTRODE PLAQUES

Nicholas J. Maskalick, Pittsburgh, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 321,645, Nov. 16, 1981. This application Mar. 29, 1982, Ser. No. 362,003
Int. Cl.³ H01M 4/75
U.S. Cl. 429—235 18 Claims



1. A method of producing a high strength, metallic, electrically conductive plaque comprising the steps of:

(1) providing a layer of iron fibers,

(2) nickel coating said iron fibers, and

(3) after nickel coating, heating the nickel coated iron fibers to form an iron-nickel alloy bond between a substantial amount of the fibers.

18. A plaque made by the method of claim 1, including an additional nickel coating applied to the fibers after the heating step, where the plaque is loaded with active material.

4,447,510

PROCESS FOR PRODUCING RELIEF COPIES IN LIGHT HARDENABLE MATERIALS WITH ULTRASONIC TREATMENT

Werner Frass, Wiesbaden, and Klaus Horn, Hofheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 7, 1982, Ser. No. 376,008
Claims priority, application Fed. Rep. of Germany, May 13, 1981, 3118884
Int. Cl.³ G03F 7/02, 7/08, 7/26
U.S. Cl. 430—3 23 Claims

1. A process for producing relief copies comprising:

exposing the light-hardenable layer of a light-hardenable copying material to a light image; said layer comprising at least one material selected from the group consisting of photopolymerizable mixtures, photodimerizable poly-

meric compounds and diazonium salt condensation products;

subjecting the exposed layer to immersion in an ultrasonic bath; and

thereafter developing the layer by washing away unexposed areas of the layer with a developer.

4,447,511
2-[2-HYDROXY-3,5-DI-TERT-OCTYLPHENYL]-2H-BENZOTRIAZOLE IN STABILIZED PHOTOGRAPHIC COMPOSITIONS

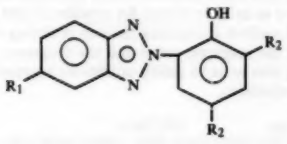
Martin Dexter, Briarcliff Manor, and Roland A. E. Winter, Armonk, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 241,170, Mar. 6, 1981, Pat. No. 4,383,863, which is a continuation-in-part of Ser. No. 100,400, Dec. 17, 1979, Pat. No. 4,278,590, which is a continuation-in-part of Ser. No. 68,275, Aug. 20, 1979, Pat. No. 4,283,327, which is a continuation of Ser. No. 6,391, Jan. 25, 1979, abandoned. This application Jan. 10, 1983, Ser. No. 457,106

Int. Cl.³ G03C *1/84*

U.S. Cl. 430—15 **8 Claims**

5. A finished photographic element comprising a support having thereon a plurality of developed and fixed photographic emulsion layers containing developed-dye image subject to fading lying between said support and a gelatin layer containing an ultraviolet absorbing hydrophobic compound selected from those represented by the formula:



wherein R_1 is hydrogen or chloro, and R_2 is tert-octyl.

4,447,512
METHOD FOR MAKING A NEGATIVE WORKING LITHOGRAPHIC PRINTING PLATE

William Rowe, Westfield, N.J.; Eugene Golda, Monsey, and Alan Wilkes, Brewster, both of N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Jan. 25, 1982, Ser. No. 342,333

Int. Cl.³ G03C *1/71, 1/54;* G03F *7/08*

U.S. Cl. 430—17 **18 Claims**

1. A radiation sensitive, negative acting composition comprising (1) an aqueous alkali- and radiation sensitive, negative acting diazonium compound and (2) an O-epoxyalkylated tetrakis (hydroxyphenyl) alkane resin or the esterified reaction product of about one equivalent thereof with less than one equivalent of an ethylentically unsaturated organic acid.

2. The composition of claim 1 wherein said esterified reaction product further comprises a saturated organic acid.

17. A radiation-sensitive, negativc-working, element comprising a substrate having coated on at least one surface thereof a radiation-sensitive, composition according to claim 1 or claim 2.

18. A lithographic printing plate comprising an element according to claim 17 wherein the substrate comprises a lithographically suitable support material which has been imagewise exposed and developed.

4,447,513
PHOTOSENSITIVE MATERIAL FOR ELECTROPHOTOGRAPHY

Nobuhiro Miyakawa, Abiko; Teruaki Higashiguchi, Tokyo; Yumiko Sano, Ibaragi, and Masatomi Funato, Sakai, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

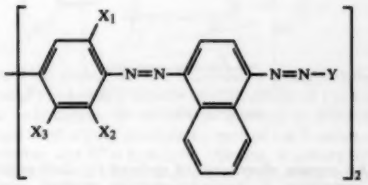
Filed Jan. 25, 1983, Ser. No. 460,758

Claims priority, application Japan, Jan. 27, 1982, 57-10214

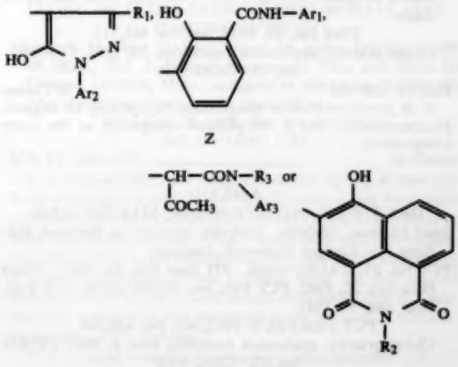
Int. Cl.³ G03G *5/06, 5/02*

U.S. Cl. 430—58 **7 Claims**

1. A photosensitive material for electrophotography, which comprises a photosensitive layer containing a tetrakis-azo pigment represented by the following formula:



wherein X_1 stands for a lower alkyl group, a lower alkoxy group or a halogen atom, X_2 and X_3 stand for a lower alkyl group, a lower alkoxy group, a halogen atom or a hydrogen atom, and Y stands for a group represented by the following group:

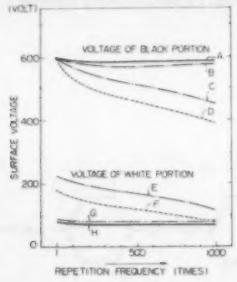


in which Z stands for benzene, naphthalene, indole, carbazole or benzofuran, or substitution product thereof, Ar_1 stands for benzene, naphthalene, or dibenzofuran, or substitution product thereof, Ar_2 and Ar_3 stand for benzene or naphthalene or substitution product thereof, R_1 stands for a lower alkyl group, a carboxyl group or an ester thereof, and R_2 and R_3 stand for a hydrogen atom, a lower alkyl group, a phenyl group or a substitution product thereof.

4,447,514
ORGANIC PHOTOSENSITIVE MATERIAL FOR ELECTROPHOTOGRAPHY COMPRISING POLYVINYLCARBAZOLE AND PYRENE OR PHENANTHRENE

Toru Nakazawa, Osaka; Akira Fushida, Suita, and Yasushi Kamezaki, Sakai, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Mar. 4, 1983, Ser. No. 472,277
Claims priority, application Japan, Mar. 5, 1982, 57-34097
Int. Cl.³ G03G 5/06
U.S. Cl. 430—81 8 Claims



1. An organic photosensitive material for electrophotography comprising a charge-transporting medium composed mainly of polyvinyl carbazole and a perylene type pigment as a charge-generating pigment dispersed in said charge-transporting medium, wherein 1 to 30 parts by weight of a halonaphthoquinone and 1 to 100 parts by weight of phenanthrene or pyrene are incorporated per 100 parts by weight of the polyvinyl carbazole.

4,447,515
PHOTOCONDUCTIVE COMPOSITION AND ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL USING IT

Syun-ichi Kondo; Kenji Sano, and Hideo Sato, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 28, 1983, Ser. No. 461,712
Claims priority, application Japan, Jan. 28, 1982, 57-10868
Int. Cl.³ G03G 5/06
U.S. Cl. 430—83 10 Claims

1. A photoconductive composition comprising an organic photoconductor and a diacylamine compound as the main components.

4,447,516
DRY TONER AND METHOD OF MAKING SAME

Josef Matkan, Adelaide, Australia, assignor to Research Hildings Pty. Limited, Eastwood, Australia

PCT No. PCT/AU82/00006, 371 Date Sep. 22, 1982, 102(e) Date Sep. 22, 1982, PCT Pub. No. WO82/02676, PCT Pub. Date Aug. 19, 1982
PCT Filed Feb. 3, 1982, Ser. No. 432,944
Claims priority, application Australia, Mar. 6, 1981, PE7512
Int. Cl.³ G03G 9/08
U.S. Cl. 430—109 13 Claims

1. The method of preparation of electroscopic marking particles having a predetermined temperature for spray drying thereof comprising the steps of

forming for each particle a core of pressure fixable material containing as its liquid phase a volatile solvent having a boiling point appreciably below said temperature,

encapsulating the said core in a polymeric shell, and

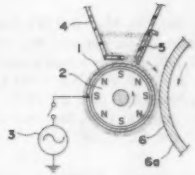
spray drying the encapsulated material at least at said predetermined temperature thereby expelling the said volatile solvent from the said core through discontinuities created in the said shell as an incident to volatilization of the solvent by the application of heat

whereby to produce dry generally solvent-free particles.

4,447,517
METHOD OF DEVELOPING ELECTROSTATIC LATENT IMAGES

Shizuo Yuge, Okazaki; Susumu Sakakibara, Toyohashi; Takuma Ishikawa, Toyokawa; Nobuo Kito, Hoi, and Toshio Yamamoto, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 19, 1982, Ser. No. 379,995
Claims priority, application Japan, May 29, 1981, 56-83034
Int. Cl.³ G03G 13/09
U.S. Cl. 430—122 6 Claims



1. A method of developing electrostatic latent images formed on a surface of an electrostatic latent image support member through employment of a magnetic brush developing device having a developing sleeve to be impressed with an AC developing bias and a magnetic roller provided in said developing sleeve so as to be driven for rotation in said developing sleeve, said method comprising the step of setting the speed of rotation of the magnetic roller and the frequency of the AC developing bias so as to satisfy conditions represented by the following equations,

$$nt_1 = mt_2 \quad (1)$$

$$nt_1(mt_2) \leqq TD \quad (2)$$

where

t_1: period (m sec.) of variation of the magnetic action due to rotation of the magnetic roller,

t_2: period (m sec.) of variation of the electrical action due to the impression of the AC developing bias,

n, m: integers having no common divisor other than 1,

Td: substantial developing time (m sec.), and which is the time required for a point on the surface of the electrostatic latent image support member to pass a developing region where the electrostatic latent image is substantially developed, whereby the period of the developing force peak value is set so as to be no longer than the substantial developing time.

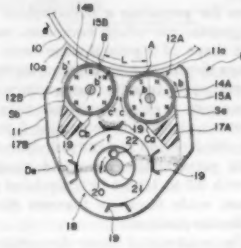
4,447,518
ELECTROSTATIC IMAGE DEVELOPING METHOD CORRECTING IRREGULARITIES OF MAGNETIC BRUSH DEVELOPING

Kenji Tabuchi, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 21, 1983, Ser. No. 460,044
Claims priority, application Japan, Feb. 5, 1982, 57-17761; Mar. 18, 1982, 57-43957
Int. Cl.³ G03G 13/09
U.S. Cl. 430—122 11 Claims

1. An electrostatic latent image developing method for developing, by a plurality of times, an electrostatic latent image carried on a surface of an electrostatic latent image support member through employment of developing sleeves having

magnetic rollers to be driven for rotation provided therein, which comprises the steps of effecting the developing for each of the plurality of times, with said magnetic roller being rotated under such a state that developing irregularities in a direction intersecting a relative moving direction of the electrostatic latent image support member with respect to said developing sleeve, are formed in a developed image when the



developing for each of the plurality of times is effected independently, causing pitches of the developing irregularities to coincide with each other, and deviating phases of the respective developing irregularities so that said respective developing irregularities are offset to each other, thereby to obtain the developed image having a uniform and sufficient image density without developing irregularities.

4,447,519

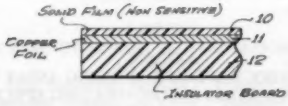
SOLID PHOTORESIST AND METHOD OF MAKING PHOTORESIST

Nathan Pritikin, 26 Coromar Dr., Goleta, Calif. 93017

Continuation of Ser. No. 331,209, Dec. 16, 1981, abandoned, which is a continuation of Ser. No. 152,623, May 23, 1980, abandoned, which is a continuation of Ser. No. 570,751, Apr. 23, 1975, abandoned. This application Jun. 29, 1983, Ser. No. 509,589

Int. Cl.³ G03C *1/76*

U.S. Cl. 430—275 **21 Claims**



1. A photoresist process in the production of a printed circuit board including the steps of:

attaching a metal foil onto an insulator board to form a substrate;

producing holes through the foil and board of the substrate;

laminating a continuous homogenous and self-supporting single layer thin film of a solid nonsensitized material which is capable of being sensitized to a photoresist, onto the foil side of the substrate covering the holes without introducing the material into the holes;

after laminating the material and substrate, sensitizing the material by wetting with a liquid sensitizer; and

drying the sensitized photoresist material.

4,447,520

ACYLPHOSPHINE OXIDES AND THEIR USE

Andreas Henne, Ludwigshafen; Anton Hesse, Weinheim; Manfred Jacobi, Frankenthal; Gunnar Schornick, Neuleiningen; Rudolf Vyvial, Ludwigshafen, and Klaus Holoch, Bobenheim-Roxheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

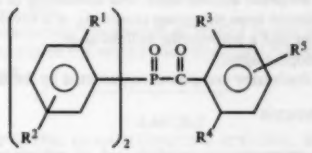
Filed Aug. 19, 1982, Ser. No. 409,555

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1981, 3133419

Int. Cl.³ C07F *9/53*; G03C *1/68*

U.S. Cl. 430—281 **6 Claims**

1. An acylphosphine oxide which may be used as a photoinitiator and is of the formula (I)



(I)

where R^1 is methyl, R^2 is a branched or straight-chain alkyl radical of 1 to 4 carbon atoms, chlorine, alkoxy of 1 to 4 carbon atoms or hydrogen, R^3 and R^4 are identical or different, and are each alkyl, alkoxy or alkylthio, each of 1 to 4 carbon atoms, or chlorine, and R^5 is hydrogen, chlorine, or alkoxy or alkylthio, each of 1 to 6 carbon atoms, or a branched or straight-chain alkyl radical of 1 to 12 carbon atoms.

4,447,521

FIXING OF TETRA(HYDROCARBYL)BORATE SALT IMAGING SYSTEMS

George V. D. Tiers, St. Paul; Steven M. Aasen, Lakeland, both of Minn.; Rex J. Dalzell, Sommerset, Wis., and Brian N. Holmes, Oakdale, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 25, 1982, Ser. No. 436,266

Int. Cl.³ G03C *1/52*

U.S. Cl. 430—337 **16 Claims**

1. A desensitizable and imageable article having at least one layer comprising a tetra(hydrocarbyl)borate, a first bleachable dye, and a second bleachable dye present in a molar ratio of at least 0.8/1.0 with respect to said borate and said first bleachable dye providing an optical density to said sheet, and having a spectral absorption curve different from the said second bleachable dye wherein said second bleachable dye is a substantially non-visible dye absorbing in the infrared or ultraviolet regions of the spectrum.

9. A process comprising exposing a desensitizable and imageable article having at least one layer comprising a tetra(hydrocarbyl)borate, a first bleachable dye, and a second bleachable dye present in a molar ratio of at least 0.8/1.0 with respect to said borate and said first bleachable dye providing an optical density to said sheet, and having a spectral absorption curve different from the said second bleachable dye to an imagewise distribution of radiation to bleach said first bleachable dye in an imagewise fashion and then generally exposing said article to radiation to bleach said second bleachable dye.

4,447,522

METHOD OF FORMING A PHOTOGRAPHIC IMAGE

Shigeo Hirano, and Yoshihiro Takagi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 345,502, Feb. 3, 1982. This application Apr. 18, 1983, Ser. No. 486,174

Claims priority, application Japan, Feb. 3, 1981, 56-14565; Feb. 3, 1981, 56-14566; Feb. 3, 1981, 56-14567

Int. Cl.³ G03C 5/24, 1/02

U.S. Cl. 430—405 17 Claims

1. A method of forming a photographic image which comprises development processing, with an alkaline activator solution, an imagewise exposed silver halide photographic light-sensitive material comprising a support having thereon at least one surface latent image silver halide emulsion layer and at least one hydrophilic colloid layer, and containing in at least one layer selected from the group consisting of a silver halide emulsion layer and a hydrophilic colloid layer

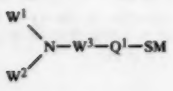
(1) a developing agent;

(2) an acylhydrazine compound represented by formula (I):

$$R^1NHNHCOR^2 \quad (I)$$

wherein R^1 represents an unsubstituted or substituted aryl group or alkyl group; and R^2 represents a hydrogen atom, or an unsubstituted or substituted aryl group or alkyl group; and

(3) at least one compound represented by formula (II):



(II)

wherein each of W^1 and W^2 can represent a hydrogen atom or an aliphatic group or W^1 and W^2 are bonded to each other to form a ring; W^3 represents a divalent aliphatic group; Q^1 represents a simple bond or a divalent heterocyclic group containing a nitrogen atom, an oxygen atom, or a sulfur atom; and M represents a hydrogen atom, an alkali metal atom, an alkaline earth metal atom, a quarternary ammonium salt, a quartenary phosphonium salt, or an amidino group, or an inorganic acid salt or an organic acid salt thereof.

4,447,523

PHOTOGRAPHIC ELEMENTS CONTAINING 2,4-DISULFONAMIDOPHENOL SCAVENGERS FOR OXIDIZED DEVELOPING AGENTS

Robert E. Ross, Rochester, and Wilbur S. Gaugh, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 389,994, Jun. 18, 1982, abandoned. This application Jun. 9, 1983, Ser. No. 502,814

Int. Cl.³ G03C 1/40, 1/06, 7/00

U.S. Cl. 430—505 15 Claims

10. In a photographic element comprising a support, at least two silver halide emulsion layers containing dye-forming couplers and a scavenger for oxidized developing agent which does not form a dye or release a photographically useful group upon reaction with said oxidized developing agent, the improvement wherein the scavenger is a 2,4-disulfonamidophenol or an alkali labile precursor of such a phenol.

11. A photographic element of claim 10 wherein the scavenger is in an interlayer between two silver halide emulsion layers.

4,447,524

PROCESS FOR PREPARING POLYOLEFIN RESIN-COATED PAPER FOR PHOTOGRAPHIC USE

Akira Uno, Matsudo; Touru Noda, Tokyo, and Akira Ninohira, Funabashi, all of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Dec. 23, 1981, Ser. No. 333,777

Claims priority, application Japan, Dec. 25, 1980, 55-184681

Int. Cl.³ G03C 1/76, 1/86, 3/00

U.S. Cl. 430—538 8 Claims

1. In a process for preparing a polyethylene resin-coated paper for photographic use which comprises melt-extruding and coating film shape of a polyethylene resin composition containing titanium dioxide onto at least one surface of a paper sheet or a synthetic paper base, the improvement comprising using polyethylene resin in the polyethylene resin layer on the photographic emulsion layer side containing 5 to 60 wt % of high density polyethylene and said polyethylene resin composition comprising polyethylene resin and titanium dioxide surface-treated with 0.2 to 1.2 wt % (calculated as Al_2O_3) of hydrous aluminum oxide based on titanium dioxide as said polyethylene resin composition.

8. A polyolefin resin-coated paper for photographic use obtained by the process as claimed in claim 1.

4,447,525

PROCESS FOR PROVIDING A MATT SURFACE ON A PHOTOGRAPHIC MATERIAL AND PHOTOGRAPHIC MATERIAL PROVIDED WITH SUCH MATT SURFACE

Angelo Vallarino, Ferrania, and Lorenzo Vittore, Montenotte, both of Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 17, 1982, Ser. No. 419,403

Claims priority, application Italy, Sep. 23, 1981, 49351 A/81

Int. Cl.³ G03C 1/78

U.S. Cl. 430—539 6 Claims

1. A method for providing a matt surface on a photographic material comprising a support base, one or more light-sensitive gelatin silver halide emulsion layers coated on said support base and a non light-sensitive outer gelatin layer coated on said layers, said method comprising the introduction into said outer layer of discrete particles in an amount of from 50 to 600 mg. per square meter, insoluble in water and substantially soluble in the alkaline processing solutions, of a copolymer containing a carboxyl group, said method being characterized by the fact that said particles, of an average diameter between 0.5 and 4 micron, are introduced into the coating composition of the outer layer as a dispersion of a methacrylic acid and ethylmethacrylate copolymer containing from 20 to 50 percent in weight of methacrylic acid, which dispersion is obtained by dispersing a solution of said copolymer in ethylacetate or water-including ethylacetate in a water solution of a hydrophilic colloid.

4,447,526

HOMOGENEOUS SPECIFIC BINDING ASSAY WITH CARRIER MATRIX INCORPORATING SPECIFIC BINDING PARTNER

Patricia A. Rupchock, and Richard J. Tyhach, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Apr. 20, 1981, Ser. No. 255,521

Int. Cl.³ G01N 33/54, 33/58, 33/52

U.S. Cl. 435—7 16 Claims

1. A method for determining the presence of a ligand in, or the ligand binding capacity of a liquid test sample, the method comprising the steps of

forming a solution or suspension of a labeled conjugate and the liquid sample, the conjugate comprising the ligand or a specific binding analog of the ligand and a label, whereby a characteristic of the label is different when the conjugate is bound by a specific binding partner for said ligand or analog, compared to when said conjugate is not

so bound, said difference in said characteristic being detectable,

contacting said sample with a carrier matrix incorporated with reagents which, when in the presence of said conjugate, produce a homogeneous specific binding assay system wherein said difference in said label characteristic is detectable, said reagents comprising said specific binding partner, thereby producing said difference in said characteristic, and

measuring said difference.

4,447,527

SINGLE TEST FORMULATIONS FOR ENZYME IMMUNOASSAYS AND METHOD FOR PREPARATION

Alex A. Monte, Cupertino, and Joan G. Centofanti, San Carlos, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Continuation of Ser. No. 183,131, Sep. 2, 1980, abandoned. This application Feb. 22, 1982, Ser. No. 350,897

Int. Cl.³ G01N *33/54*

U.S. Cl. 435—7 **9 Claims**

1. A dry powder formulation capable of uniform dissolution upon mixing with water useful for performing a single assay of the presence of a ligand in an aqueous sample, which comprises:

	Wt %
Antiserum	5×10^{-6}–0.2
Enzyme bound ligand conjugate	5×10^{-6}–0.1
Substrates	1–15
Protein	0–5
Non-ionic detergent	0.1–5
Neutral salt	2–20
Buffer	5–30
Bulking agent	qs

9. A method for preparing the formulation according to claim 1 which comprises:

mixing a first powder formulation containing in weight percent of said first powder formulation 0.005–0.5 of the antiserum, 70–98 of the bulking agent, 0–20 of the buffer, and 0–10 of the protein; a second powder formulation containing in weight percent of said second powder formulation 0.005–0.05 of the enzyme bound ligand conjugate, 70–98 of the bulking agent, 0–20 of the buffer, and 0–10 the protein; substrates; any remaining buffer; remaining bulking agent; a non-ionic detergent and a volatile inert halocarbon to provide a homogeneous mixture;

removing the halocarbon in vacuo to provide a granular mixture; and

powdering the granular mixture.

4,447,528

DETECTING INTRINSIC FACTOR BLOCKING SITE ANTIBODY

James E. Ellis, Stoughton; Graham P. Lidgard, Wellesley; Gerald Odstrchel, Walpole, and Louis J. Riceberg, Needham, all of Mass., assignors to Corning Glass Works, Corning, N.Y.

Filed Aug. 10, 1981, Ser. No. 291,354

Int. Cl.³ G01N *33/58, 33/82, 33/50*

U.S. Cl. 435—7 **7 Claims**

1. A process for detecting the presence of intrinsic factor blocking site antibody which comprises:

(a) admixing a biological fluid sample suspected of containing the blocking antibody with receptor having selective binding sites for said antibody, said receptor being intrinsic factor immobilized on an inanimate support;

(b) incubating the mixture from step (a) under conditions sufficient to enable substantially all of the blocking antibody present to bind to the receptor, whereby a solid phase comprising said inanimate support with the blocking antibody bound thereto and a liquid phase comprising said biological fluid sample without said blocking antibody result;

(c) separating the solid phase from the liquid phase;

(d) admixing a liquid comprising a labeled ligand for said selective binding sites with the separated solid phase, said ligand being vitamin B_{12};

(e) incubating the mixture from step (d) under conditions sufficient to enable the labeled ligand to bind to the selective binding sites of said receptor which did not bind to said blocking antibody, whereby a second solid phase comprising said inanimate support with at least one of blocking antibody and labeled ligand bound thereto and a second liquid phase comprising unbound labeled ligand result;

(f) separating the second solid phase from the second liquid phase; and

(g) determining the amount of labeled ligand present in at least one of the second solid phase and the second liquid phase.

4,447,529

PREPARING HOMOGENEOUS SPECIFIC BINDING ASSAY ELEMENT TO AVOID PREMATURE REACTION

Alfred C. Greenquist; Patricia A. Rupchock; Richard J. Tyhach, all of Elkhart, and Bert Walter, South Bend, all of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jul. 6, 1981, Ser. No. 280,260

Int. Cl.³ G01N *33/54, 33/52*

U.S. Cl. 435—7 **18 Claims**

1. A method for preparing a test device useful in performing a homogeneous specific binding assay to determine the presence of a ligand in, or the ligand binding capacity of, a liquid test sample, the method comprising the steps of

incorporating a carrier with a first reagent mixture comprising water, a reagent capable of reacting with a label to produce a detectable response, and a specific binding partner to the ligand;

drying the carrier incorporated with the first reagent mixture;

incorporating the carrier with a second reagent mixture comprising a solvent selected from toluene, acetone, chloroform, methylene chloride, n-propanol and ethylene dichloride, and a label conjugate comprising the label coupled to a ligand moiety or a specific binding analogue thereof; and

drying the carrier incorporated with the first and second mixtures.

4,447,530

BIOCONVERSION OF INDUSTRIAL CELLULOSIC PULP MATERIALS TO PROTEIN-ENRICHED PRODUCT

Murray M. Young, 63-50 Bluesprings Dr., Waterloo, Ontario, Canada N2J 4M1

Continuation of Ser. No. 240,329, Mar. 4, 1981, Pat. No. 4,379,844, which is a continuation-in-part of Ser. No. 3,998, Jan. 17, 1979, abandoned. This application Nov. 30, 1982, Ser. No. 445,487

The portion of the term of this patent subsequent to Apr. 12, 2000, has been disclaimed.

Int. Cl.³ C12P *21/00*

U.S. Cl. 435—68 **4 Claims**

1. A process for the formation of proteinaceous material, which consists of:

(a) aerobically fermenting a sterile mixture of a cellulose-starchy material in divided form selected from the group consisting of banana, potato, yam and cassava and a solution of non-carbon nutrient supplement in a culture of the fungus, *Chaetomium cellulolyticum*, at a pH of about 5 to about 7 and at a temperature of about 30° to about 45° C. for a time sufficient to grow the fungus and provide a solid mass consisting of about 20 to about 80% DM of the

fungus and the balance of unfermented cellulose-starchy material, and

(b) separating the resulting solid mass from the fermentation medium.

4,447,531

GLUCOSE ISOMERASE FROM FUNGI OF THE BASIDIOMYCETES CLASS

Robert O. Horwath, Westport, and Robert M. Irbe, Norwalk, both of Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jun. 30, 1982, Ser. No. 393,849
Int. Cl.³ C12P 19/24, 19/20; C12R 1/645
U.S. Cl. 435—94 13 Claims

1. A process for preparing fructose which comprises contacting an aqueous solution of glucose with glucose isomerase produced by at least one species of the Basidiomycetes class of fungi to convert at least a portion of said glucose to fructose.

4,447,532

PROCESS FOR THE MANUFACTURE OF LOW D.E. MALTODEXTRINS

Lowell E. Coker, Keokuk, Iowa, and Kalyanasundram Venkatasubramanian, New Brunswick, N.J., assignors to H. J. Heinz Company, Pittsburgh, Pa.

Filed Apr. 29, 1982, Ser. No. 373,220
Int. Cl.³ C12P 19/14
U.S. Cl. 435—99 3 Claims

1. A process for producing a low D.E. starch hydrolyzate which comprises (1) liquefying non-waxy corn starch in the presence of an alpha amylase by heating at a temperature within the range of from about 104°–107° C., (2) maintaining the liquefied starch hydrolyzate of step (1) at a temperature above about 93° C. in the presence of alpha-amylase so as to dextrinize the hydrolyzate to a D.E. level within the range of from about 10-13, (3) terminating the reaction of step (2) by the addition of sufficient mineral acid to lower the pH of the dextrinized hydrolyzate to a level at which residual alpha-amylase is inactivated within the period of from about thirty to about sixty minutes while maintaining the hydrolyzate temperature at least above about 93° C., (4) refining the resulting hydrolyzate from step (3) while maintaining the hydrolyzate at a temperature of at least above about 76° C. during the refining operations, and (5) spray drying the refined hydrolyzate of step (4) so as to produce a dry free-flowing starch hydrolyzate.

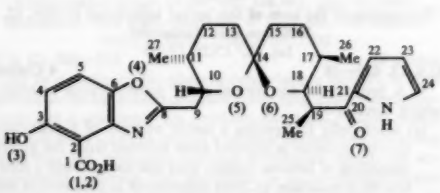
4,447,533

PROCESS TO PRODUCE ANTIBIOTIC X-14885A

Chao-Min Liu, Cedar Grove, N.J.; Homer D. Tresner, LaFarge, Wis., and John Westley, Cedar Grove, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 311,132, Oct. 14, 1981, Pat. No. 4,352,934.
This application Jul. 30, 1982, Ser. No. 403,844
Int. Cl.³ C12P 17/18; C12R 1/465
U.S. Cl. 435—119 1 Claim

1. A process to produce a compound of the formula



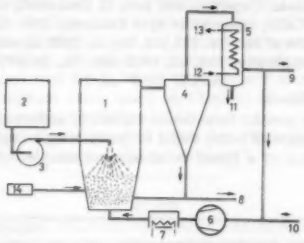
which comprises fermentatively cultivating a strain having the identifying characteristics of Streptomyces sp. X-14885 NRRL 12350 in an aqueous carbohydrate solution containing a nitrogenous nutrient under submerged aerobic conditions and thereafter isolating the product from said fermentation solution.

4,447,534

METHOD OF PRODUCING ETHANOL THROUGH FERMENTATION OF CARBOHYDRATES

Otto Moebus, Lämmerstücken 36, Kiel-Russee; Michael Teuber, Gartenstr. 114, Flintbek, and Helmut Reuter, Dorfstede 23, Kiel-Schulensee, all of Fed. Rep. of Germany

Filed Feb. 2, 1982, Ser. No. 344,937
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1981, 3105581
Int. Cl.³ C12P 7/06
U.S. Cl. 435—161 12 Claims



1. A method of producing ethanol by fermentation of carbohydrates, which comprises:

maintaining a gas-fluidized bed of microorganisms suitable for ethanol production,

adding at least one fermentable, carbohydrate-containing watery nutrient solution to said fluidized bed,

conducting fermentation in said fluidized bed while introducing gas into said fluidized bed as a continuous phase, the conditions of said fermentation being essentially provided by the termperature and partial oxygen pressure of said gas,

removing a portion of said gas from said fluidized bed,

cooling and fractionating said removed gas to precipitate an ethanol/water mixture from said gas, and

removing ethanol from said mixture.

4,447,535

PROCESS FOR THE RECOVERY OF A CONCENTRATED STILLAGE

Friedrich J. Zucker, and Georg Osthaus, both of Neuss, Fed. Rep. of Germany, assignors to Supraton F. J. Zucker GmbH, Neuss, Fed. Rep. of Germany

Continuation of Ser. No. 275,447, Jun. 22, 1981, abandoned.
This application Apr. 14, 1983, Ser. No. 484,929
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1980, 3023874
Int. Cl.³ C12P 7/14
U.S. Cl. 435—162 2 Claims

1. A process for the recovery of a concentrated stillage in the production of alcohol from starch or starch-containing raw materials, comprising the steps of:

(a) mixing said starch or starch-containing materials in finely divided form with an aqueous process liquor;

(b) introducing the mixture from step (a) together with steam and enzymes suitable for making alcohol coaxially to the center of a rotor-stator homogenizer wherein the starch is rapidly gelatinized thermally and mechanically in a zone of high density of shear and cavitation forces at a temperature between 70° C. and 115° C. and the enzyme is ultrafinely distributed;

(c) enzymatically liquefying the starch in the product of step (a);

(d) saccharifying and fermenting the product of step (c);

(e) distilling the product of step (d) to produce alcohol and stillage;

(f) separating solid coarse particles from said stillage; and

(g) repeating the cycle of steps (a) through (f) using the stillage essentially as obtained from step (f) at least three times without further purification as the process liquor in step (a), until the dry solids content of the stillage has increased to about 30%.

4,447,536

STABILIZATION OF ENZYME COMPOSITIONS

Gerard J. Moskowitz, Mequon, Wis., assignor to Dairyland Food Laboratories, Waukesha, Wis.

Filed Oct. 25, 1982, Ser. No. 436,638

Int. Cl.³ C12N *9/96, 9/20, 9/64*

U.S. Cl. 435—188 10 Claims

1. In a method for making an enzyme-containing composition including the steps of grinding edible tissue taken from between the base of the tongue and the trachea of young ruminants and drying the mixture to remove a substantial portion of the moisture therefrom, the improvement comprising

admixing with the ground tissue a stabilizing reagent comprising (a) at least 0.1 weight % stannous chloride, (b) about 0.1 to about 1.0 weight % zinc chloride, or (c) at least 0.1 weight % of a divalent cationic salt selected from the group consisting of calcium chloride, calcium carbonate, calcium orthophosphate in mono, di or tri form, calcium oxide, calcium hydroxide, calcium sulfite, calcium salts of organic acids, zinc chloride, zinc carbonate, zinc acetate, zinc oxide, zinc sulfite, stannous chloride, titanium dioxide and mixtures thereof and at least 0.05 weight % of a food acceptable reducing agent, other than stannous chloride, capable of reacting with proteins without causing substantial denaturation thereof, said weight percentages being based on the weight of the ground tissue.

4,447,537

TICK CELL LINES

Conrad E. Yunker; John C. Cory, both of Hamilton, and Harold R. Meibos, Darby, all of Mont., assignors to The United States of Americas as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jan. 22, 1981, Ser. No. 227,166

Int. Cl.³ A61K *39/00, 39/12*

U.S. Cl. 435—235 18 Claims

1. A continuous cell line of embryonic cells of Acari: Ixodidae of the species *Dermacentor variabilis* designated RML-15 and having ATCC No. CRL 8052.

5. A continuous cell line of embryonic cells of Acari: Ixodidae of the species *Dermacentor parumapertus* designated RML-16 and having ATCC No. CRL 8053.

4,447,538

MICROORGANISM CONTAINING GENE FOR HUMAN CHORIONIC SOMATOMAMMOTROPIN

Howard M. Goodman; John Shine, and Peter H. Seeburg, all of San Francisco, Calif., assignors to Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 897,710, Apr. 19, 1978, Pat. No. 4,363,877, which is a continuation-in-part of Ser. No. 836,218, Sep. 23, 1977, abandoned. This application Feb. 5, 1982, Ser. No. 346,124

Int. Cl.³ C12N *1/20, 15/00*

U.S. Cl. 435—253 7 Claims

1. A microorganism containing a recombinant DNA transfer vector whose genetic constitution comprises a nucleotide sequence coding for at least a portion of human chorionic somatomammotropin, said portion identified to contain the sequence of human chorionic somatomammotropin.

4,447,539

MICROORGANISM CAPABLE OF DEGRADING PHENOLICS

Lewis J. Pillis, Roanoke, and Lois T. Davis, Salem, both of Va., assignors to Sybron Corporation, Rochester, N.Y.

Continuation of Ser. No. 229,025, Jan. 27, 1981, Pat. No. 4,352,886. This application Apr. 28, 1982, Ser. No. 372,775

Int. Cl.³ C12N *1/20;* C12R *1/40*

U.S. Cl. 435—253 1 Claim

1. A biologically pure culture of the microorganism *Pseudomonas putida* CB-173 having the identifying characteristics of ATCC-31800, said microorganism being capable upon culturing in wastewater containing phenolics of utilizing such as an assimilable source of carbon.

4,447,540

MICROORGANISM STRAIN OF SPECIES *CLAVICEPS PURPUREA*

Karin Strnadova; Jan Kybal; Eduard Svoboda, all of Prague, and Jiri Spacil, Opava, all of Czechoslovakia, assignors to SPOFA, spojene podniky prozdravotnickou vyrobu, Prague, Czechoslovakia

Filed Jul. 20, 1982, Ser. No. 400,037

Claims priority, application Czechoslovakia, Jul. 28, 1981, 5731-81

Int. Cl.³ C12N *1/14;* C12P *17/18;* C12R *1/645*

U.S. Cl. 435—254 1 Claim

1. Biologically pure culture of *Claviceps purpurea* (Fr.) Tul. variant strain CCM F-725 which can be fermented to produce ergocornine, alpha-ergocryptine, and beta-ergocryptine.

4,447,541

METHODS FOR DECONTAMINATING SOIL

Robert L. Peterson, East Syracuse, N.Y., assignor to Galson Research Corporation, East Syracuse, N.Y.

Filed Jun. 6, 1983, Ser. No. 501,620

Int. Cl.³ D06M *16/00*

U.S. Cl. 435—264 27 Claims

11. A method of decontaminating soil by biologically decomposing a polyhalogenated organic compound with which said soil is contaminated, said method comprising the step of admixing with said soil an effective amount of a reagent mixture which is capable of at least partially dehalogenating said organic compound and thereby increasing its biodegradability, said mixture comprising an alkali constituent and a sulfoxide catalyst and said alkali constituent being an alkali metal hydroxide, a mixture of an alkali metal hydroxide and an alcohol, or an alkoxide.

20. A method of decontaminating soil according to claim 11 which also includes the step of, subsequent to the mixing of the reagent mixture with the soil, inoculating said soil with at least one specie of bacteria which is effective to biologically decompose said at least partially dehalogenated organic compound.

4,447,542

ANALYTICAL TEST COMPOSITION, DEVICE AND METHOD FOR THE DETERMINATION OF PEROXIDATIVELY ACTIVE SUBSTANCES

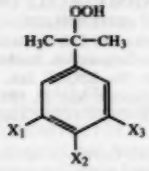
Mary L. Gantzer, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Apr. 4, 1983, Ser. No. 481,630

Int. Cl.³ G01N *33/52, 33/72*

U.S. Cl. 436—66 9 Claims

1. In a composition for the determination of a peroxidatively active substance in a test sample, the composition comprising an organic hydroperoxide and an indicator capable of providing a detectable response in the presence of said organic hydroperoxide and peroxidatively active substance, the improvement wherein said organic hydroperoxide is a substituted cumene hydroperoxide having the formula



in which any one of the X substituents is lower alkyl of from 1 to 6 carbon atoms, Cl, Br, I, NO_2 or carboxyl; or any two of the X substituents, same or different, are lower alkyl of from 1 to 6 carbon atoms, Cl, Br, I, NO_2 or carboxyl.

4,447,543

METHOD FOR MEASURING VOLATILE HYDRIDES

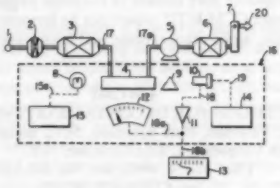
Hikaru Harada, Kamakura; Teruo Akiyama, and Tuneo Hiyama, both of Tokyo, all of Japan, assignors to Nippon Sanso K.K., Tokyo, Japan

Division of Ser. No. 109,329, Jan. 4, 1980, Pat. No. 4,309,385. This application Nov. 18, 1981, Ser. No. 207,945

Claims priority, application Japan, Jan. 26, 1979, 54-8027; Jan. 26, 1979, 54-8262[U]

Int. Cl.³ G01N *21/00*

U.S. Cl. 436—72 **2 Claims**



1. A method for measuring the concentration of hydrides selected from the group consisting of diborane, arsine, phosphine, stibine, hydrogen selenide and monosilane, comprising reacting said hydrides with an excess of mercuric oxide at an ambient temperature to form stoichiometric amounts of gaseous atomic mercury, water and the element consisting of the non-hydrogen constituent of said hydrides measuring the amount of said atomic mercury and determining the concentration of said hydrides by reference to the amount of said atomic mercury produced and the stoichiometric ratios for said reaction; wherein the lower limit of the quantity of said hydrides capable of measurement by said method is below the allowable concentration for said hydrides.

4,447,544

METHOD AND REAGENT FOR DETERMINING INORGANIC PHOSPHATE IN BIOLOGICAL SAMPLE

Bruce P. Neri, North Andover, and Stanley M. Liffmann, Methuen, both of Mass., assignors to Instrumentation Laboratory Inc., Lexington, Mass.

Filed Jul. 22, 1982, Ser. No. 400,686

Int. Cl.³ G01N *33/52, 33/84, 33/96*

U.S. Cl. 436—105 **16 Claims**

1. An aqueous reagent for determining inorganic phosphate in a protein-containing liquid biological sample comprising

a molybdate salt,

an acid capable of reacting with said molybdate salt to form molybdic acid for complexation with said phosphate to form phosphomolybdate complexes,

a ferric salt in an amount sufficient to inhibit turbidity in the sample, and

a nonionic surfactant reagent in an amount sufficient to further inhibit turbidity in the sample,

said molybdate salt and said acid being present in amounts sufficient to form an amount of molybdic acid sufficient to produce a detectible color change when complexed with said phosphate in said sample.

11. A serum-free, aqueous inorganic phosphate standard solution for use in conjunction with a method in which the amount of phosphate in a protein-containing biological fluid sample is determined, said standard solution comprising

a predetermined amount of phospate, and

polyvinylpyrrolidone, in an amount ranging between 2 and 6 grams per liter of said standard solution.

4,447,545

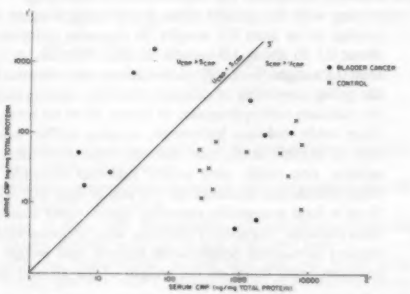
BLADDER CANCER DETECTION

Sally R. DeFazio, Watertown; James J. Gozzo, Westwood, and Anthony P. Monaco, Newton, all of Mass., assignors to New England Deaconess Hospital, Boston, Mass.

Continuation-in-part of Ser. No. 203,146, Nov. 3, 1980, abandoned. This application Jun. 15, 1982, Ser. No. 388,675

Int. Cl.³ G01N *33/48, 33/68*

U.S. Cl. 436—518 **10 Claims**



1. A method for screening a patient for the presence of a bladder carcinoma, said method comprising the steps of:

(A) assaying for the ratio of C-reactive protein to total protein in a sample of the urine of said patient;

(B) assaying for the ratio of C-reactive protein to total protein in a sample of the serum of said patient; and

(C) comparing the ratio determined by assay in step A to the ratio determined by assay in step B, whereby

(i) a finding of the absence of C-reactive protein in said urine sample is indicative of the absence of a bladder carcinoma; and

(ii) a finding that the ratio determined in step A is greater than the ratio determined in step B is indicative of the presence of a bladder carcinoma.

4,447,546

FLUORESCENT IMMUNOASSAY EMPLOYING OPTICAL FIBER IN CAPILLARY TUBE

Tomas E. Hirschfeld, Livermore, Calif., assignor to Myron J. Block, North Salem, N.H.

Filed Aug. 23, 1982, Ser. No. 410,340

Int. Cl.³ G01N *21/00, 21/64, 33/54, 33/58*

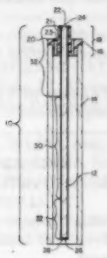
U.S. Cl. 436—527 **15 Claims**

1. Apparatus for performing immunoassays using an antigen-antibody complex incorporating a fluorescent tag capable of emitting fluorescent radiation when excited by exciting radiation, said apparatus comprising in combination:

an optical fiber transmissive to both said exciting radiation and said fluorescent radiation;

a coating on at least a portion of said fiber, said coating having a plurality of sites, each being capable of having attached thereto a selected moiety of said antigen-antibody complex so as to leave substantially unaffected the

activity of said selected moiety for forming said antigen-antibody complex; and



means for controlling a volume of capillary dimensions bounded by said portion of said fiber.

4,447,547

IMMUNOASSAY FOR MEASUREMENT OF RETICULOCYTES, AND IMMUNOREACTIVE REAGENTS FOR USE THEREIN

Robert H. Allen, Englewood, and Paul A. Seligman, Denver, both of Colo., assignors to University Patents, Inc., Norwalk, Conn.

Division of Ser. No. 138,785, Apr. 9, 1980, Pat. No. 4,332,785. This application Mar. 9, 1982, Ser. No. 356,539

Int. Cl.³ G01N *33/54, 33/58, 33/60*

U.S. Cl. 436—543 **4 Claims**

1. Anti-human transferrin receptor antibody.

4,447,548

HIGH POROSITY CERAMIC MATERIALS AND METHOD FOR MAKING SAME

Monte F. Huebsch, III, 3770 Flora Vista Ave. #2008, Santa Clara, Calif. 95051

Filed Aug. 18, 1982, Ser. No. 409,113

Int. Cl.³ C04B *21/00*

U.S. Cl. 501—85 **9 Claims**

1. A method for producing a high porosity ceramic material comprising the steps of:

(a) wetting a finely divided, non-crystalline, amorphous silica with a wetting agent;

(b) combining said wetted silica with a ceramic slip to produce a mixture, wherein said wetted silica and said ceramic slip are combined in the proportions of at least one part and at most four parts silica to each part of slip; and

(c) removing the majority of said wetting agent and other fluids from said mixture to produce a solid, low-density, highly porous bisque.

4,447,549

NON-LINEAR DIELECTRIC ELEMENT

Sho Masujima, Tokyo; Masahide Shibuya, Nikahomachi; Iwaya Shoichi, Kisagatamachi; Kenichi Umeda, Honjo; Yasunobu Oikawa, Nikahomachi; Hisao Abe, Kisagatamachi; Yoshifumi Midori, Honjo; Shinobu Fujiwara, Nikahomachi, and Nobuaki Kikuchi, Kisagatamachi, all of Japan, assignors to TDK Kabushiki Kaisha, Tokyo, Japan

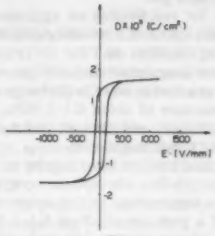
Continuation of Ser. No. 261,914, May 8, 1981, abandoned, which is a continuation of Ser. No. 087,408, Oct. 22, 1979, abandoned. This application Mar. 22, 1983, Ser. No. 476,250

Claims priority, application Japan, Oct. 20, 1978, 53-129233

Int. Cl.³ C04B *35/46*

U.S. Cl. 501—138 **6 Claims**

1. A non-linear dielectric element utilizing the non-linearity of the dielectric constant that depends on an electric field applied thereto consisting of a polycrystal which is mainly composed of $BaTiO_3$ and has the chemical composition expressed by the formula $A_yB_zO_3$, wherein the molar ratio of y/z ranges from 0.92 to 0.99, said composition of $A_yB_zO_3$ is $Ba_y(Ti_xSn_{1-x})_zO_3$, the amount (x) of titanium is in the range of from



0.90 to 0.98 and the polycrystal further includes at least one oxide selected from the group consisting of manganese oxide and chromium oxide in an amount of from 0.02 to 0.5% based on 100% by weight of said $A_yB_zO_3$ composition.

4,447,550

LEAD ALUMINOBOROFLUOROSILICATE MOLDABLE GLASSES

Dominique L. J. Leroy, Montigny Sur Loing, and Jean-Pierre Mazeau, Avon, both of France, assignors to Corning Glass Works, Corning, N.Y.

Filed Jun. 13, 1983, Ser. No. 488,960

Claims priority, application France, Sep. 30, 1982, 82 16448

Int. Cl.³ C03C *3/08, 3/10*

U.S. Cl. 501—75 **2 Claims**

1. A moldable optical glass of the lead aluminoborofluorosilicate type having an index of refraction between about 1.65–1.82, an Abbe number between about 27–39, a softening point not exceeding 500° C., good chemical durability in a moist atmosphere, and high stability which consists essentially, expressed in terms of weight percent on the oxide basis, of

SiO_2	8–20
B_2O_3	5–20
PbO	50–70
Al_2O_3	1–11
F	2–7

4,447,551

PROCESS FOR REACTIVATING IRIDIUM-CONTAINING CATALYSTS

Shun C. Fung, Bridgewater, N.J., and Richard W. Rice, Clemson, S.C., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed May 5, 1982, Ser. No. 374,975

Int. Cl.³ B01J *23/96, 23/46, 23/64*; C10G *35/085*

U.S. Cl. 502—37 **21 Claims**

1. A process for reactivating an agglomerated catalyst containing metallic iridium comprising the steps of:

(a) pretreating the catalyst by contact with a substantially elemental oxygen-free atmosphere comprising a halide-providing compound at an elevated temperature to provide about 1.3 weight percent and above, halide to the catalyst, taken as the coke-free dry, catalyst; and

(b) redispersing the metallic iridium from step (a) while maintaining said 1.3 weight percent and above halide provided to the catalyst by contact at an elevated temperature with an atmosphere comprising elemental halogen and a redispersing aid selected from elemental oxygen, or elemental oxygen and water, wherein said halogen and oxygen are present in a halogen to oxygen volume ratio in

the range of about 0.05 to 10, for a time sufficient to substantially redisperse said metallic iridium.

5. The process of claim 1 wherein said halide-providing compound is one which generates a hydrogen halide in the presence of hydrogen gas.

20. A process for reactivating an agglomerated platinum-iridium on alumina catalyst, containing platinum and iridium oxides, comprising the steps of:

(a) contacting said agglomerated catalyst with a hydrogen atmosphere at a temperature in the range of about 300° to 540° C., a pressure of about 0.1–2 MPa, for a sufficient time to substantially reduce said oxides of platinum and iridium to the respective metals;

(b) pretreating said catalyst from step (a) by contact with an elemental oxygen-free atmosphere comprising hydrogen chloride at a temperature in the range of about 300° to 540° C. and a pressure of about 0.1–2 MPa for a time sufficient to saturate the catalyst with chloride; and

(c) redispersing the metallic iridium and platinum while maintaining a saturated chloride level by contact with an atmosphere comprising elemental chlorine and elemental oxygen and water in a chlorine to oxygen volume ratio of about 0.2 to 5 at a temperature in the range of about 500° to 540° C., and a pressure of about 0.1–2 MPa for a time sufficient to effect about a 75–100% redispersion of both metallic platinum and iridium.

21. A process for reactivating an agglomerated metallic platinum-iridium on alumina catalyst, which has been partially decoked by hydrogen gas, comprising the steps of:

(a) pretreating said catalyst by contact with an elemental oxygen-free atmosphere comprising hydrogen chloride at a temperature in the range of about 300° to 540° C. and a pressure of about 0.1–2 MPa for a time sufficient to saturate the catalyst with chloride; and

(b) redispersing the metallic iridium and platinum while maintaining a saturated catalyst chloride level by contact with an atmosphere comprising elemental chlorine and elemental oxygen and water, in a chlorine to oxygen volume ratio of about 0.2 to 5, at a temperature in the range of about 500° to 540° C., and a pressure of about 0.1–2 MPa for a time sufficient to effect about a 75–100% redispersion of both metallic platinum and iridium.

4,447,552
PASSIVATION OF METAL CONTAMINANTS ON CRACKING CATALYST

John C. Hayes, Palatine, Ill., and Carmela Castillo, Baton Rouge, La., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 344,106, Jan. 29, 1982, Pat. No. 4,382,015, which is a continuation-in-part of Ser. No. 209,073, Nov. 21, 1980, Pat. No. 4,364,848, which is a continuation-in-part of Ser. No. 132,602, Mar. 21, 1980, abandoned. This application Mar. 3, 1983, Ser. No. 471,936

The portion of the term of this patent subsequent to Nov. 30, 1999, has been disclaimed.

Int. Cl.³ B01J *29/38;* **C10G** *11/18, 11/05*

U.S. Cl. 502—41 **8 Claims**

1. A process for passivating a metal on fluidized cracking catalyst which has been contaminated with said metal due to the use of said catalyst in a fluidized cracking system, and wherein said catalyst is cycled between a cracking zone, in which said catalyst is contacted at an elevated temperature with a hydrocarbon feedstock containing said metal which deposits on said catalyst, and a regeneration zone, in which carbon is oxidized and thereby removed from said catalyst, said metal being included in the group comprising nickel, vanadium, cobalt or iron, said catalyst comprising a crystalline aluminosilicate contained in a inorganic oxide matrix containing less than about 10 wt % alumina excluding alumina contained in said crystalline aluminosilicate which process comprises contacting said catalyst, prior to the cycling of said catalyst to said cracking zone, with a gas or mixture of gases comprising hydrocarbons selected from the group consisting of hydrocarbons containing one, two and three carbon atoms at passivation reaction conditions selected so as to first effect substantially complete reduction of said metal to its metallic state and then deactivation of said metal in its metallic state by carbonization.

2. A process in accordance with claim 1 wherein said inorganic oxide matrix comprises silica, titania, magnesia, zirconia, boria or chromia.

3. A process in accordance with claim 1 wherein said inorganic oxide matrix comprises silica.

4,447,553
PROCESS FOR RE-ACTIVATION OF SOLID ACID CATALYST

Tokuo Fujiso, Yokosuka; Tadashi Ohmori, Yokohama, and Soichi Nomura, Tokyo, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Jul. 28, 1982, Ser. No. 402,619

Claims priority, application Japan, Aug. 4, 1981, 56-122280

Int. Cl.³ B01J *37/12*

U.S. Cl. 502—36 **3 Claims**

1. In the re-activation of a solid acid catalyst consisting essentially of an active alumina carrier and fluorine and chlorine both supported thereon, the amounts of said fluorine and said chlorine being 0.3–1.0% and 0.6–2.0%, respectively, based on the total weight of the catalyst composition, the process of re-activation which comprises:

(i) subjecting the catalyst to a calcination treatment at 350°–550° C. in which it is brought into contact with an inert gas containing less than 1 mole % of molecular oxygen thereby to burn off high molecular weight hydrocarbons that have been deposited on the catalyst during reaction;

(ii) measuring the contents of fluorine and chlorine in the calcined catalyst to see if the content of fluorine is greater or smaller than 70% of the fresh catalyst;

(iii) subjecting the calcined catalyst to a halogenation treatment at 200°–500° C. in which it is brought into contact with an inert gas or a non-reducing gas containing 50–1,000 ppm of moisture and entrained with chlorine, a chlorine compound or a mixture thereof, in the event the catalyst upon said calcination treatment contains fluorine in an amount greater than 70% of a fresh catalyst; and

(iv) alternatively, subjecting the calcined catalyst to a halogenation treatment in which it is brought into contact with an inert gas or a non-reducing gas containing 50–1,000 ppm of moisture and entrained with a mixture of chlorine and fluorine, chlorine and a fluorine compound, a chlorine compound and fluorine, a chlorine compound and a fluorine compound, or a compound containing in the molecule both chlorine and fluorine, in the event the catalyst upon said calcination treatment contains fluorine in an amount less than 70% of a fresh catalyst.

4,447,554
HYDROALKYLATION CATALYST AND METHODS FOR PRODUCING AND EMPLOYING SAME

Timothy P. Murtha, and Ernest A. Zuech, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 154,548, May 29, 1980, Pat. No. 4,329,531. This application Mar. 16, 1982, Ser. No. 358,565

Int. Cl.³ B01J *29/14*

U.S. Cl. 502—73 **5 Claims**

1. A process of preparing a highly active hydroalkylation catalyst, said process comprising:

ion exchanging a crystalline zeolite with rare earth, nickel and ammonium cations; and

calcining the ion exchanged crystalline zeolite in the presence of air at a temperature essentially maintained in the range of between about 150° C. to about 400° C.

2. A process as in claim 1 further comprising preventing the temperature during the calcination step from exceeding a

temperature of 400° C. for any substantial period of time as compared with the time at which the catalyst is calcined at a temperature of from 150° C. to 400° C.

4,447,555

HYDROCRACKING CATALYSTS

Stephen L. Parrott, and John W. Myers, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 291,662, Aug. 10, 1981, abandoned. This application Apr. 4, 1983, Ser. No. 481,957

Int. Cl.³ B01J *29/06, 29/16*

U.S. Cl. 502—74 **36 Claims**

1. A process of producing a hydrocracking catalyst having a high activity and a slow deactivation rate comprising the steps of:

(1) contacting a Group IVB metal oxide with at least one Group VIII metal-containing substance,

(2) contacting the product of step (1) with at least one Group VIB metal-containing substance,

(3) combining the product of step (2) with an acidic cracking catalyst component containing a zeolite, and

(4) recovering the product of step (3).

2. The process of claim 1 wherein the Group IVB metal oxide is titanium dioxide.

3. The process of claim 1 wherein the Group VIII metal is selected from the group consisting of nickel, cobalt, and combinations thereof.

11. The catalyst produced by the process of claim 1.

4,447,556

HYDROCARBON CONVERSION CATALYST AND USE THEREOF

Mark J. O'Hara, Mt. Prospect, and Russell W. Johnson, Villa Park, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Apr. 4, 1983, Ser. No. 481,969

Int. Cl.³ B01J *21/12, 29/14*

U.S. Cl. 502—74 **12 Claims**

1. A catalytic composite comprising a combination of a carrier material, a Group VIB metal component and Group VIII metal component wherein said Group VIB metal component and said Group VIII metal component are incorporated in said catalytic composite by means of a non-aqueous organic solution of a Group VIB metal compound and a Group VIII metal compound, wherein said non-aqueous organic solution comprises dimethylformamide, formamide, diethylformamide, ethylformamide, methylformamide, pyridine, aniline or toluene and wherein said catalytic composite is calcined in a non-oxidizing atmosphere.

4,447,557

PROCESS FOR SELECTIVE FORMATION OF C4 COMPOUNDS AND THIOL-CONTAINING CATALYST SYSTEM USED THEREIN

Wayne R. Pretzer; Thaddeus P. Kobylinski, both of Gibsonia, and John E. Bozik, Pittsburgh, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 215,555, Dec. 11, 1980, Pat. No. 4,339,610. This application Mar. 1, 1982, Ser. No. 353,376

Int. Cl.³ B01J *31/20*

U.S. Cl. 502—161 **9 Claims**

1. A catalyst system comprising a cobalt catalyst selected from the group consisting of (a) a cobalt carbonyl, (b) a hydrido cobalt carbonyl and (c) a cobalt-containing material convertible to a cobalt carbonyl or a hydrido cobalt carbonyl, an iodine promoter and a thiol defined by the folowing formula:

RSH

wherein R is selected from the group consisting of saturated or unsaturated, straight or branched chain alkyl radicals having from one to 24 carbon atoms, cycloalkyl radicals having from three to 40 carbon atoms, aryl radicals having from six to 20 carbon atoms, aralkyl and alkaryl radicals having from six to 40 carbon atoms and halogen substituted derivatives thereof.

4,447,558

PROCESS FOR PRODUCING AN ANTIMONY CONTAINING METAL OXIDE CATALYST

Yutaka Sasaki, and Yoshimi Nakamura, both of Kanagawa, Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1982, Ser. No. 397,723

Claims priority, application Japan, Jul. 13, 1981, 56-108175

Int. Cl.³ B01J *27/02, 27/14, 21/02, 27/24*

U.S. Cl. 502—215 **12 Claims**

1. A process for preparing an antimony-containing metal oxide catalyst, comprising the steps of:

calcining at about 500° to 1,000° C. a metal oxide composition containing, as essential elements, antimony and at least one element selected from the group consisting of iron, cobalt, nickel, manganese, uranium, tin, and copper;

impregnating the calcined oxide composition with a tellurium-containing solution;

drying the impregnated composition; and

calcining the dried composition at about 400° to 850° C., wherein the tellurium-containing impregnating solution is a homogeneous, stable solution containing tellurium and at least one element selected from the group consisting of molybdenum and tungsten, said solution containing a tellurium compound and at least one heteropoly acid selected from the group consisting of phosphomolybdic acid, silicomolybdic acid, phosphotungstic acid, and silicotungstic acid, and said solution containing nitrate radicals in concentration of at least 5 g/liter and having a pH lower than 3.

4,447,559

MULTI-LAYER ION EXCHANGER FOR USE IN ION-EXCHANGE CHROMATOGRAPHY AND METHOD OF PRODUCING THE SAME

Yuzuru Hanaoka; Takeshi Murayama, and Setsuo Muramoto, all of Musashino, Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 390,208, Jun. 21, 1982, abandoned. This application Jul. 12, 1982, Ser. No. 397,060

Claims priority, application Japan, Jul. 30, 1981, 56-119689

Int. Cl.³ C08D *5/20*

U.S. Cl. 521—28 **3 Claims**

1. A method of producing an ion exchanger for use in ion exchange chromatography, comprising the steps of

suspending fine sized particles of a styrene-divinylbenzene copolymer into alcohol;

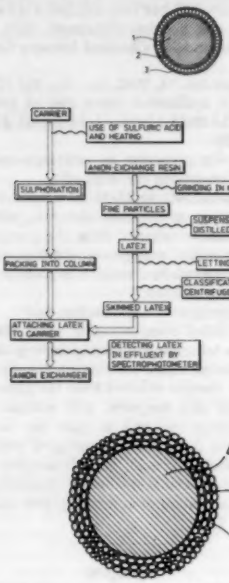
classifying the resulting suspension using a centrifugal separator;

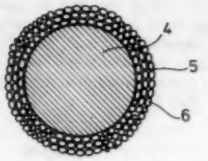
taking a classified liquid phase out of said supsension, adding coarse sized styrene-divinylbenzene copolymer particles into said liquid phase, and then evaporating alcohol component by heating said liquid phase at a temperature of about 50° C.;

adding a mixture of chloromethylstyrene and divinylbenzene having additionally incorporated therein alpha, alpha-azobisisobutyronitrile to said liquid phase, just before completion of said evaporation, and then heating said liquid phase at a temperature of about 80° C., in order to effect polymerization reaction between said chloromethylstyrene and said divinylbenzene; and

aminating chloromethyl groups in said chloromethylstyrene-divinylbenzene copolymer, by means of trimethylamine treatment, whereby said copolymers are made hydrophilic, and to thereby introduce anion exchange groups into said fine sized particles, wherein said fine sized particles have sizes ranging from 0.1 to 0.5 μm; and wherein said coarse sized styrene-divinylbenzene copoly-

mer particles added to said liquid phase has sizes ranging from 10 to 20 μm; and wherein said polymerization reaction between said chloromethylstyrene and said divinylbenzene produces said chloromethylstyrene-divinylbenzene copolymer which acts as a binder; and wherein said binder is positioned between each of said fine and coarse





particles and is grafted onto each particle thereby to form intimate attachment of a plurality of fine particles to each other through mutual attachment to said binder, and to form intimate attachment of a plurality of said fine particles to each coarse particle through mutual attachment to said binder.

4,447,560

LOW DENSITY FIBROUS SHEET MATERIAL

Jay L. Piersol, Lancaster, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed May 6, 1982, Ser. No. 375,395

Int. Cl.³ C08J *9/28, 9/30*

U.S. Cl. 521—68 **7 Claims**

1. A method of forming a low density fibrous sheet material which method comprises forming an aqueous slurry that comprises fibers, a soluble salt selected from the group consisting of aluminum salts, ferric salts and stannic salts, and a sufficient amount of an alkaline hydroxide to provide a slurry pH within the range of from about 6 to about 10, said alkaline hydroxide serving to convert said soluble salt to a water insoluble hydroxide; depositing a synthetic rubber binder on said fibers to form rubber-coated fibers; adding the resulting fibrous slurry to a solution of a foamable detergent in water; foaming the resulting mixture, which has a consistency of from about 4 to about 15 weight percent solids, to homogeneously suspend the fibrous slurry therein; and drying the mixture to thereby form the low density fibrous material wherein from about 5 to about 50 parts by weight of synthetic rubber binder are employed for every 100 parts of fiber.

4,447,561

STABLE WATER GLASS SOLUTIONS, PROCESS FOR THEIR PREPARATION AND USE FOR ORGANOSILICATE FOAMS AS WELL AS A PRODUCTION PROCESS THEREFOR

Peter Horn, Heidelberg; Robert Gehm, Limburgerhof; Matthias Marx, Bad Durkheim, and Artur Roeber, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 14, 1983, Ser. No. 513,724

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1982, 3227580

Int. Cl.³ C08G *18/14, 18/30, 18/38;* C08K *3/00*

U.S. Cl. 521—118 **12 Claims**

1. A stable water glass solution obtained by

(A) Mixing

(a) a solution of

(i) 100 parts by weight of an aqueous alkalisilicate solution, and

(ii) 1.5 to 20 parts by weight of an alkali hydroxide

with

(b) 2 to 12 parts by weight of a tertiary amine, and subsequent oxyalkylation of the resultant two-phase reaction mixture with

(c) at least one mole of an alkylene oxide per mole of tertiary amine, or

(B) by oxyalkylation of

(a) 2 to 12 parts by weight of a tertiary amine with

(b) at least one mole of an alkylene oxide per mole of tertiary amine

and mixing of the resultant mixture with

(c) a solution of

(i) 100 parts by weight of an aqueous alkali-silicate solution, and

(ii) 1.5 to 20 parts by weight of alkali hydroxide.

7. A process for the preparation of organosilicate foam by reacting an organic polyisocyanate and a compound with reactive hydrogen atoms in the presence of catalysts, blowing agents, and optionally auxiliaries and additives, wherein the mixtures of stable water glass solutions of claim 1 and tertiary amino group containing polyether polyols are used as compounds with reactive hydrogen atoms.

4,447,562

AMINO-POLYSACCHARIDES AND COPOLYMERS THEREOF FOR CONTACT LENSES AND OPHTHALMIC COMPOSITIONS

Edward J. Ivani, 2360 E. 74 St., Brooklyn, N.Y. 11234

Division of Ser. No. 283,613, Jul. 15, 1981, Pat. No. 4,365,050. This application Sep. 30, 1982, Ser. No. 430,813

Int. Cl.³ C08L *5/08, 89/00;* C07G *7/00*

U.S. Cl. 523—105 **6 Claims**

1. A pharmaceutical composition containing one or more active ingredients and a carrier formed from any of the polymers formed from D-glucosamine or derivatives thereof selected from the group consisting of N-acetyl-D-glucosamine, substituted N-acetyl-D-glucosamine, derivatives of N-acetyl-D-glucosamine and graft and block polymers of N-acetyl-D-glucosamine, and a compound selected from the group consisting of a silicone, collagen, acrylonitrile, acrylamide, methacrylate acids and esters, alkylaminoalkyl methacrylate and hydroxyalkyl methacrylate and pyrrolidone and derivatives of pyrrolidone, said pharmaceutical composition being used either on the body of a patient or used internally.

4,447,563

ANAEROBICALLY CURABLE COMPOSITION AND PROCESS FOR PREPARATION THEREOF

Kunio Kanaoka; Takanori Okamoto, and Hideaki Matsuda, all of Kagawa, Japan, assignors to Okura Kogyo Kabushiki Kaisha, Japan

Filed Oct. 28, 1982, Ser. No. 437,480
Claims priority, application Japan, Oct. 30, 1981, 56-172814
Int. Cl.³ C08L 75/04
U.S. Cl. 523—176 18 Claims

1. An anaerobically curable composition which consists essentially of the following components (a), (b) and (c):

(a) 100 parts by weight of polymerizable mixture consisting of the following (i) and (ii):

(i) 20 to 90% by weight of a urethane polymethacrylate composed of an addition-reaction product of

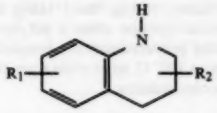
(1) a polybutadiene-based liquid rubber containing hydroxyl groups in its molecule and not less than 70% of 1,4-bonds,

(2) a polyisocyanate compound, and

(3) a hydroxyl group-containing methyacrylate in such a ratio that the resulting mixture contains OH groups and NCO groups approximately in an equivalent amount, and

(ii) 80 to 10% by weight of a polymerizable methacrylate,

(b) 0.1 to 5.0 parts by weight of the salt of o-benzoic sulfimide with an amine represented by the general formula (I):



(I)

wherein R_1 and R_2 each independently stand for hydrogen or methyl group, and

(c) 0.0001 to 0.2 part by weight of an ammonium or amine salt of a chelate-forming polycarboxylic acid containing at least one amine group and a plurality of carboxylic acid groups.

4,447,564

REACTIVE RESIN COMPOSITIONS AND MOLDED SUBSTANCES MADE THEREFROM

Rudolf Grimmer, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,904
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1981, 3141955
Int. Cl.³ C08K 3/26
U.S. Cl. 523—200 10 Claims

1. A filled resin composition comprising an epoxy resin hardened with an anhydride hardener and interbonded with carbonate salt filler particles having a coating of a multibasic organic or inorganic acid bonded to the filler particle surfaces.

4,447,565

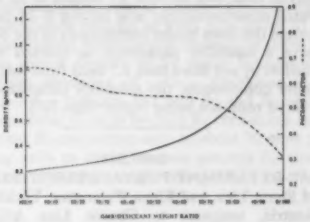
METHOD AND COMPOSITION FOR MOLDING LOW DENSITY DESICCANT SYNTACTIC FOAM ARTICLES

James W. Lula, Bonner Springs, Kans., and James R. Schicker, Lee's Summit, Mo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 7, 1981, Ser. No. 328,327
Int. Cl.³ C08J 9/32
U.S. Cl. 523—219 14 Claims

1. A process for molding to size a desiccant syntactic foam article having a density of 0.2–0.9 g/cc and a moisture capacity of 1–12% by weight, comprising the steps of:

(a) charging a mold with a powdery mixture of an activated molecular sieve desiccant, microspheres and a thermosetting resin, the amount of the desiccant being sufficient to provide the required moisture capacity, and the amounts of the microspheres and resin being such that the microspheres/desiccant volume fraction exceeds the packing factor by an amount sufficient to substantially avoid shrinkage without causing excessively high molding pressures;



(b) covering the mold and heating the covered mold to a temperature and for an amount of time sufficient to melt the resin; and

(c) tightly closing the mold and heating the closed mold to a temperature and for an amount of time sufficient to cure the resin, and removing the resultant desiccant syntactic foam article from the mold.

4,447,566

MODIFIED LIQUID PERMEABLE ASBESTOS DIAPHRAGMS WITH IMPROVED DIMENSIONAL STABILITY

Louis W. Hruska, Geneva, and Shan-Pu Tsai, Mentor, both of Ohio, assignors to Eltech Systems Corp., Boca Raton, Fla.

Filed Jan. 27, 1983, Ser. No. 461,565
Int. Cl.³ C08L 27/12
U.S. Cl. 523—221 6 Claims

1. A preformulated, free-flowing particulate blend of resinous modifiers designed for direct incorporation into an aqueous slurry of abestos fibers prior to forming same into an electrolyte permeable diaphragm separator for an electrolytic cell consisting essentially of chunky particles of a perfluorocarbon polymer having an average equivalent spherical diameter of between about 0.1 and about 100 microns, about 2 to 8 parts per part by weight of said chunky particles of highly fibrous particles of the same or another perfluorocarbon polymer having an average length of about 1,000 to 20,000 microns and an average equivalent cross-sectional diameter of between about 2 and about 200 microns, and between about 0.5 and about 5% by weight, based upon the combined weight of both the chunky and fibrous particles of perfluorocarbon polymer, of an effective synthetic organic wetting agent.

4,447,567

AQUEOUS, OXIDATIVELY DRYING COATING COMPOSITION

Dirk J. F. Geerdes, Hoogerheide, and Petrus J. C. Nelen, Ossendrecht, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Dec. 27, 1982, Ser. No. 452,927
Claims priority, application Netherlands, Dec. 29, 1981, 8105879
Int. Cl.³ C08L 51/08; C09D 3/64, 3/68
U.S. Cl. 523—501 10 Claims

1. An aqueous, oxidatively drying coating composition based on a binder system obtained by polymerization of one or more monoethylenically unsaturated compounds in the presence of an aqueous solution of an ionized oxidatively drying alkyd resin, characterized in that per 100 parts by weight (calculated on solid matter) the binder system also contains

5–65 parts by weight (calculated on solid matter) of a dispersed, oxidatively drying alkyd resin having a number average molecular weight in the range of 600–6000, a viscosity not higher than 30 Pa.s, measured at 20° C., an acid number of 0–20 and a hydroxyl number of 0–130, which is substantially built up of 3–40% by weight of a hydroxyl compound having 2–8 hydroxyl groups, 2–44% by weight of a di- and/or multivalent carboxylic acid, of which 20–100 mole % is a cycloaliphatic dicarboxylic acid, and 20–90% by weight of an ethylenically unsaturated monocarboxylic acid having 6–24 carbon atoms, and wherein the three binder components of the binder system each have a solubility parameter, as defined hereinbefore, which differs by not more than 1.7 units from that of the other two binder components, the solubility parameter of the dispersed alkyd resin not being higher than 10.5.

4,447,568

FLAME-RETARDANT POLYACRYLONITRILE FIBER

Gerhard Stern, Linz, and Klaus Weinrotter, Vöcklabruck, both of Austria, assignors to Chemie Linz AG, Linz and Chemiefaser Lenzing AG, Lenzing, both of, Austria

Filed May 10, 1983, Ser. No. 493,333
Claims priority, application Austria, May 19, 1982, 1979/82
Int. Cl.³ C08K *5/34*
U.S. Cl. 524—101 8 Claims

1. A flame-retardant polyacrylonitrile fiber comprising a parent polymer with an acrylonitrile content of at least 85% by weight and 15 to 40% by weight based on the polymer of tris-2,3-dibromopropyl isocyanurate, said fiber being prepared by the so called "dry spinning method".

4,447,569

POLYVINYL CHLORIDE RESIN COMPOSITIONS HAVING A HIGH VOLUME RESISTIVITY AND RESISTANCE TO DETERIORATION WHEN HEATED AT TEMPERATURES ABOVE 100 DEGREES C.

Lawrence R. Brecker, Brooklyn; Charles Keeley, Wantagh, and Stuart D. Brilliant, Levittown, all of N.Y., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Oct. 8, 1982, Ser. No. 433,563
Int. Cl.³ C08K *5/05;* C08L *27/06*
U.S. Cl. 524—109 18 Claims

1. An electrical grade polyvinyl chloride resin composition suitable for use as electrical insulation material, having a high volume resistivity and a high resistance to deterioration when heated at temperatures above 100° C., comprising as the essential ingredients a polyvinyl chloride resin and, in the amounts indicated, in parts per one hundred of resin, from about 30 to about 100 parts carboxylic acid ester plasticizer; from about 5 to about 25 parts filler; from about 1 to about 20 parts epoxy compound, and from about 1 to about 20 parts lead alkyl phenolate.

4,447,570

BINDER COMPOSITIONS FOR MAKING NONWOVEN FABRICS HAVING GOOD HYDROPHOBIC REWET PROPERTIES

Gerald R. Cook, Wyomissing; John G. Iacoviello, Allentown; Robert K. Pinschmidt, Jr., Allentown, and George Davidowich, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 1, 1982, Ser. No. 353,445
Int. Cl.³ B32B *5/16;* D04H *1/58*
U.S. Cl. 524—127 34 Claims

1. A binder composition for nonwoven fabrics which comprises

(a) an anionic immobilizable surfactant which is a phosphate ester surfactant or a free carboxylic acid group containing surfactant,

(b) a latex comprising a vinyl acetate-ethylene-olefinically unsaturated carboxylic acid interpolymer colloidally suspended in water, the interpolymer containing about 0.5 to 7.0 weight percent olefinically unsaturated carboxylic acid and sufficient ethylene to provide the interpolymer with a glass transition temperature of from about −30° to +20° C., and

(c) a polyvalent metal complex compound.

4,447,571

STABILIZATION OF POLYURETHANES

Shmuel Dabi, Fair Lawn, and Peter Loewrigkeit, Wyckoff, both of N.J., assignors to Witco Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 138,761, Apr. 9, 1980, abandoned. This application Oct. 15, 1981, Ser. No. 311,588
Int. Cl.³ C08K *5/24*
U.S. Cl. 524—192 4 Claims

1. A process for the preparation of thermal oxidation color stabilized cured anionic polyurethanes, comprising preparing a water dispersed polyurethane having pendant acid groups, said polyurethane being prepared from the reaction of a polyhydroxy polyol and a polyhydroxy polyol having a pendant carboxylic acid group, with a polyisocyanate, said acid groups having been neutralized with a volatile alkyl or alkanol tertiary amine which vaporizes at a temperature below about 150° C., said water dispersed anionic polyurethane being further treated with a hydrazide being an additive selected from the group consisting of monohydrazide and a polyhydrazide in an amount sufficient to impart thermal oxidation color stability to the polyurethane during curing, there being an absence of reactive NCO terminal groups when a polyhydrazide is selected and curing the polyurethane at a temperature of from about 150° C. to about 190° C. to provide a product which has thermal oxidation color stability.

4,447,572

FIRE RETARDANT POLYAMIDE

Daniel J. Scharf, East Amherst; Charles S. Ilardo, Tonawanda; Willis T. Schwartz, Grand Island, and Gideon Salee, Williamsville, all of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Nov. 6, 1981, Ser. No. 318,771
Int. Cl.³ C08K *5/02, 5/06, 5/34;* C08L *77/02*
U.S. Cl. 524—371 20 Claims

1. A flame retarded, electrically insulated polyamide polymer composition comprising from about 30–90% by weight of a polyamide, from about 5–30% by weight of a halogenated organic flame retardant selected from the group consisting of chlorinated and brominated derivatives of monocyclic or polycyclic hydrocarbons of aliphatic or aromatic character and from about 1 to about 20% by weight of a polymer blend resin said blend resin having a lower melt viscosity than said polyamide, having acceptable thermal stability to withstand fire retardant system processing temperatures and being at least partly insoluble in said polyamide so that said blend resin cannot ordinarily be maintained as a monophasic homogeneous solution with said polyamide.

15. A method of increasing the arc tracking resistance of polyamide compositions containing from about 30 to about 90% by weight of polyamide and about 5 to about 30% by weight of a halogenated organic flame retardant selected from the group consisting of chlorinated and brominated derivatives of monocyclic or polycyclic hydrocarbons of aliphatic or aromatic character, comprising incorporating therein from about 1 to about 20% by weight, based on the total polyamide composition, of a polymer blend resin which has a lower melt viscosity than said polyamide, has acceptable thermal stability to withstand fire retardant system processing temperatures and is at least partly insoluble in said polyamide so that said blend resin cannot ordinarily be maintained as a monophasic homogeneous solution with said polyamide.

4,447,573

TEXTILE HOT-MELT ADHESIVE

Gernot Horlbeck, Haltern, and Rainer Feldmann, Marl, both of Fed. Rep. of Germany, assignors to Chemische Werke Huels AG, Marl, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,630

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1981, 3138187

Int. Cl.³ C09J 3/16, 5/06

U.S. Cl. 524—394 12 Claims

1. A textile hot-melt adhesive, comprising a mixture of

A. a linear, saturated, high-molecular weight copolyester reaction product of

I. 100 mole % of a dicarboxylic acid component of 75–95 mole % of terephthalic acid

5–25 mole % of isophthalic acid or phthalic acid,

II. 100 mole % of a diol component of

40–70 mole % of 1,4-butanediol

30–60 mole % of another diol of 5–12 carbon atoms which is an alkane diol or an oxa- or dioxa-alkane diol,

wherein the copolyester has a melting point of 110° to 130° C. and a crystallization half-life value, measured at 50° C., of <7 minutes;

B. 0.05–0.5% by weight of an inert inorganic nucleating agent having an average particle diameter of 0.2–3 μm; and

C. 0.01–0.2% by weight of an alkaline earth metal salt of a fatty acid of 11–18 carbon atoms and an average particle diameter of 40–60 μm; wherein all weight percentage ranges are based on the amount of component A.

4,447,574

INJECTION MOLDABLE AMIDE-IMIDE POLYMERS CONTAINING CALCIUM MOIETIES

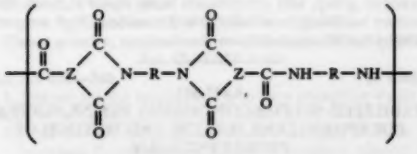
Robert G. Keske; Gary T. Brooks, both of Naperville, and Ronald E. Bockrath, Oswego, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 29, 1982, Ser. No. 393,436

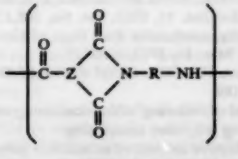
Int. Cl.³ C08G 69/26; C08K 3/22, 3/24

U.S. Cl. 524—400 15 Claims

1. An injection moldable blend comprising about 0.05 to 3.0 weight percent of calcium hydroxide or calcium acetate and an amorphous polyamide-imide polymer with inherent viscosities in the range of about 0.3 to about 3.0 measured at 25° C. and 0.5% w/v in 100 percent sulfuric acid comprising units of:

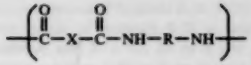


and units of:



and units of:

-continued



wherein "Z" is a trivalent benzene ring; R comprises R_1 or a mixture of R_1 and R_2, R_1 and R_2 are divalent aliphatic hydrocarbon radicals containing two to sixteen carbon atoms or are aromatic hydrocarbon radicals of from 6 to about 20 carbon atoms or two divalent hydrocarbon radicals of from 6 to 20 carbon atoms joined directly or by stable linkages selected from the group consisting of —O—, methylene, —CO—, —SO_2— and —S— radicals, and said R_1 and R_2 containing units run from about 10 mole percent R_1 containing units and 90 mole percent R_2 containing units to about 90 mole percent R_1 containing units to about 10 mole percent R_2 containing units and X is a divalent aromatic radical.

4,447,575

COMPOSITIONS COMPRISING A POLY(METHYL ETHENYL BENZENE) RESIN AND MINERAL OIL

Robert V. Russo, Brooklyn, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 119,681, Feb. 8, 1980, Pat. No. 4,361,506. This application Sep. 30, 1982, Ser. No. 430,157

The portion of the term of this patent subsequent to Nov. 30, 1999, has been disclaimed.

Int. Cl.³ C08K 5/01

U.S. Cl. 524—484 6 Claims

1. A composition comprising mineral oil and a poly(methyl ethenyl benzene) polymer comprised entirely of polymerized methyl ethenyl benzene prepared in the absence of preformed polymer by polymerizing a mixture of 0 to 0.1 percent by weight 1-methyl-2-ethenyl benzene, 0 to 15 percent by weight 1-methyl-3-ethenyl benzene and at least 85 percent by weight 1-methyl-4-ethenyl benzene; said mineral oil comprising up to 10 percent by weight of the composition.

4,447,576

ROOM TEMPERATURE VULCANIZABLE POLYORGANOSILOXANE COMPOSITIONS WHICH ARE PAINTABLE FOLLOWING CURING

Miyoji Fukayama, and Chikara Ichijo, both of Ichihara, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Jun. 7, 1983, Ser. No. 501,954

Claims priority, application Japan, Jun. 9, 1982, 57-99044

Int. Cl.³ C08K 5/16

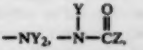
U.S. Cl. 524—714 18 Claims

1. A room temperature vulcanizable polyorganosiloxane composition comprising

(A) 100 parts by weight of a hydroxyl-terminated polyorganosiloxane exhibiting a viscosity of from 0.02 to 1000 Pa.s at 25° C.;

(B) from 0.5 to 30 parts by weight of at least one organosilicon compound containing at least two functional groups selected from the group consisting of amido and aminoxy; and

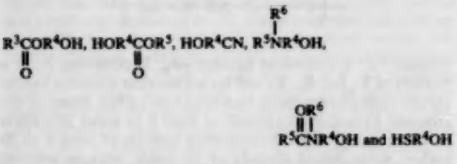
(C) from 0.01 to 15 parts by weight of an alcohol containing a substituent selected from the group consisting of acyloxy, alkoxycarbonyl, carboxy, cyano,



mercapto, and the combination of a carbon-to-carbon triple bond and at least one ether-type oxygen atom, where each Y and Z are individually selected from the group consisting of hydrogen, hydrocarbyl, and halohydrocarbyl.

4. The composition of claim 1 where said alcohol is repre-

sented by a general formula selected from the group consisting of



where R^3 represents a monovalent hydrocarbon radical or a monovalent halohydrocarbon radical where the halogen is chlorine, bromine, or fluorine, R^4 represents a bivalent hydrocarbon radical or a bivalent halohydrocarbon radical, R^5 and R^6 are individually selected from the group consisting of hydrogen atoms, monovalent hydrocarbon radicals, and monovalent halohydrocarbon radicals.

4,447,577

EMULSIONS OF DICYCLOPENTADIENE CONTAINING POLYESTERS

Charles E. Bayha, Collierville, Tenn., assignor to Alpha Corporation of Tennessee, Collierville, Tenn.

Continuation-in-part of Ser. No. 370,380, Apr. 21, 1982, abandoned. This application Sep. 20, 1982, Ser. No. 419,773

Int. Cl.³ C08L 67/00

U.S. Cl. 524—845 **10 Claims**

1. An aqueous polyester emulsion, said emulsion comprising at least about 20% by weight of a polyester and up to about 80% by weight water,

said polyester formed from dicyclopentadiene, maleic acid and a compound containing at least two alcoholic hydroxy groups, said dicyclopentadiene being present in a molar ratio of at least about 1 compared to said maleic acid.

4,447,578

THERMOPLASTIC RESIN COMPOSITION

Takayuki Katto; Yasumasa Komatsu, and Zenya Shiiki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1982, Ser. No. 451,325

Claims priority, application Japan, Dec. 21, 1981, 56-206645

Int. Cl.³ C08L 51/00

U.S. Cl. 525—75 **4 Claims**

1. A thermoplastic resin composition having high heat resistance, high impact resistance and a Vicat softening point of 140° C. or higher, said composition comprising:

(A) 50 to 90% of a copolymer obtained by polymerizing a monomer mixture comprising 10 to 50% of methyl methacrylate, 5 to 25% of acrylonitrile, and 40 to 75% in total of 2-isopropenylnaphthalene and α-methylstyrene, the quantity of the 2-isopropenylnaphthalene being 5 to 70% of the total quantity of the 2-isopropenylnaphthalene and the α-methylstyrene and wherein the polymerization yield of the thus-produced copolymer is 80% or higher; and,

(B) 10 to 50% of a graft copolymer obtained by polymerizing 15 to 50 parts of a grafting monomer component comprising 10 to 100% of methyl methacrylate, 0 to 70% of styrene, and 0 to 30% of acrylonitrile in the presence of 50 to 85 parts of a butadiene rubber in latex form having a particle size of 1500–8000 Å; the total of the grafting monomer component and the butadiene rubber constituting 100 parts, all parts and percentages herein being by weight.

4,447,579

EPOXY RESIN ADHESIVE COMPOSITIONS

Yasuo Takagi, Chiba, and Michiharu Horibe, Kamagaya, both of Japan, assignors to Cemedine Co., Ltd. and Tohto Kasei Co., Ltd., both of Tokyo, Japan

Filed Apr. 20, 1982, Ser. No. 370,090

Claims priority, application Japan, Apr. 27, 1981, 56-64518

Int. Cl.³ C08F 8/32; C08L 63/10

U.S. Cl. 525—113 **17 Claims**

1. A room temperature curable epoxy resin adhesive composition having excellent T-peel strength, comprising an epoxy resin containing an average of more than one epoxy group per molecule and a polyamide-amine hardener which is obtained by the reaction of a diene rubber having terminal carboxyl groups and the reaction product of an aliphatic polyamine and one or two compounds containing carboxyl groups selected from the group consisting of tall acid and polymerized fatty acid.

4,447,580

RESIN COMPOSITION, COATING MATERIAL COMPRISING SAID RESIN COMPOSITION AND METHOD FOR FORMING COATINGS

Hideo Ai, and Naohiro Tsuruta, both of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

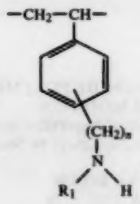
Filed Nov. 12, 1981, Ser. No. 320,801

Claims priority, application Japan, Nov. 17, 1980, 55-160842

Int. Cl.³ C08F 299/04; C08L 27/04, 63/10

U.S. Cl. 525—121 **22 Claims**

1. A resin composition comprising (A) a polymer comprising units of the structural formula (I):

 (I)

wherein R_1 represents a group selected from the class consisting of isopropyl, sec-butyl, t-butyl, a C_{5-20} alkyl group, a C_{3-20} cycloalkyl group, a C_{5-20} alkenyl group, a C_{3-20} hydroxyalkyl group, a C_{5-20} alkoxyalkyl group, a C_{3-20} aminoalkyl group, a C_{6-20} aryl group and a C_{6-20} arylalkyl group, and n represents 0, 1 or 2, and (B) a polymer having an electron attractive group and an α, β-ethylenic double bond adjacent to said electron attractive group, said composition being stable at room temperature but being crosslinkable and curable at high temperatures by the Michael addition reaction.

4,447,581

STABILIZED SULFUR-CONTAINING RESINS, SUCH AS POLYPHENYLENE SULFIDE AND METHOD OF PRODUCING SAME

Ferdinand Quella, Gauting, and Hans-Friedrich Schmidt, Erasburg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 14, 1982, Ser. No. 388,179

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1981, 3127355; Mar. 16, 1982, 3209525

Int. Cl.³ C08L 81/00, 81/04, 81/06

U.S. Cl. 525—189 **13 Claims**

12. A method of reducing sulfur-containing exhaust gases in sulfur-containing polymers comprising:

adding an effective amount of an additive polymer having at least one reactive radical selected from the group consisting of amino radicals, amido radicals, imido radicals, and

keto radicals therein to a sulfur-containing polymer, said additive polymer being of approximately identical thermo-stability as the sulfur-containing polymer and said effective amount being in a range of about 0.1% to about 5% by weight, based on the weight of said sulfur-containing polymer.

4,447,582

METHOD OF PROCESSING LOW MOLECULAR WEIGHT EPM AND EPDM POLYMERS

Harold J. Gros, Baton Rouge, La., assignor to Copolymer Rubber & Chemical Corporation, Baton Rouge, La.

Filed Apr. 8, 1983, Ser. No. 482,960

Int. Cl.³ C08L *51/06, 23/26, 23/28*

U.S. Cl. 525—279 **26 Claims**

1. A method of processing to improve the handling of an EPM or EPDM polymer of low molecular weight comprising the step of reacting the low molecular weight polymer with a monomer capable of providing quaternary salt forming groups on the polymer, and reacting the resulting polymer with a difunctional cross linking agent whereupon the cross linked polymer acquires the characteristics of a high molecular weight polymer which can be more easily handled and wherein the cross linked polymer can be broken down by exposure to elevated temperature to re-acquire the characteristics of the lower molecular weight polymer component.

4,447,583

OXIDIZED POLYACETYLENE AND A PROCESS FOR THE PREPARATION THEREOF

Jürgen Hocker, Bergisch Gladbach; Rolf Dhein, Krefeld, and Rudolf Merten, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 10, 1982, Ser. No. 387,179

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1981, 3123802

Int. Cl.³ C08F *8/42*

U.S. Cl. 525—328.1 **5 Claims**

1. A process for increasing the electrical conductivity of polyacetylene, said process comprising partially oxidizing polyacetylene with a compound of trivalent iron or trivalent cobalt.

4,447,584

PROCESS FOR THE SYNTHESIS OF TERTIARY PHOSPHINE OXIDES AND SULPHIDES, AND NEW TERTIARY PHOSPHINE OXIDES AND SULPHIDES

Wilfrid Bergeret, Corbeil Essonnes; Jean-Claude Gautier, Ablon sur Seine; Serge Raynal, Draveil, and Sylvie Bolleau, Paris, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Jan. 18, 1982, Ser. No. 339,864

Claims priority, application France, Jan. 19, 1981, 81 00856

Int. Cl.³ C08F *8/40*

U.S. Cl. 525—340 **10 Claims**

1. Process for the synthesis of a tertiary phosphine oxide or sulfide of formula $R_1R_2R_3PZ$, in which Z=S or O,

R_1 and R_2 are identical or different and are a linear or branched C_1 to C_{18} alkyl, C_7 to C_{10} arylalkyl, phenyl, C_7 to C_{12} aryl, C_7 to C_{10} alkaryl, or R_1 and R_2, taken together, form a C_4 to C_9 polymethylene chain or a C_4 to C_9 hydrocarbon chain containing at least one ethylenic unsaturation;

R_3 is an organic halogen or polyhalogen compound containing at least one halogen atom in the form of a halogenoaryl group or halogenomethyl group;

which consists of:

(a) reacting a dihydrocarbylphosphine oxide or sulfide R_1R_2PZH, in which R_1, R_2 and Z are as defined hereinabove with 1.1–6 molar equivalents of an alkali metal amide of formula MNH_2 in which M is an alkali metal whereby an alkali metal dihydrocarbylphosphinite or thiophosphinite of formula R_1R_2PZM in which R_1R_2Z and M are as defined hereinabove is obtained, and then (b) reacting said compound of formula R_1R_2PZM from step (a) with an organic halide of formula R_3X in which R_3 is as defined hereinabove and X is Cl, Br or I and isolating said tertiary phosphine oxide or sulfide from the reaction mixture.

4,447,585

POLYMER BOUND ARYL SUBSTITUTED CROWN ETHERS

Dane K. Parker, Massillon, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

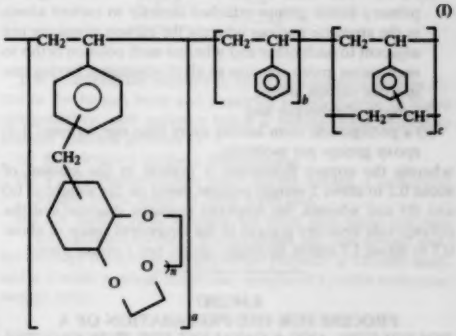
Division of Ser. No. 354,563, Mar. 4, 1982. This application Oct. 24, 1983, Ser. No. 544,340

Int. Cl.³ G08F *8/00*

U.S. Cl. 525—359.2 **2 Claims**

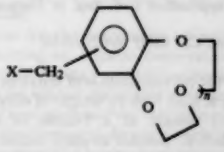
1. A process to prepare a composition of of matter of the structural formula (I):

(I)



wherein n is 3 or 4 and the ratio of a to b to c may vary from 1:98:1 to 50:49:1 to 1:49:50, which comprises the following steps in an anhydrous environment of: (1) dissolving a compound of sturctural formula (II)

(II)



wherein n is 3 or 4 and X is a chlorine, bromine or iodine radical; in an inert solvent selected from the group consisting of $CHCl_3$, CH_2Cl_2, CCl_4, 1,2-dichloroethane, tetrachloroethane, CS_2, nitrobenzene, alkanes of 5 to 15 carbon atoms, benzene, and alkylated benzenes; (2) adding this solution to a crosslinked polystyrene resin wherein said resin has at least one percent crosslinking and a particle size of no more than 20 mesh; (3) removing the inert solvent under reduced pressure; (4) adding thereto a catalyst selected from the group consisting of aluminum chloride, zinc chloride, boron trifluoride, stannic chloride and titanium tetrachloride, wherein the catalyst is dispersed in a reaction solvent selected from the group consisting of 1,2-dichloroethane, nitrobenzene, methylene chloride or the catalyst is added to the polystyrene resin which is dispersed within a said reaction solvent; (5) heating the reaction mixture to 50°–120° C. for 2 to 72 hours; and (6) isolating the resulting polymer bound aryl substituted crown ether.

4,447,586

METAL FLUOBORATE CATALYZED HINDERED AROMATIC AMINE CURING AGENTS FOR POLYEPOXIDE RESINS

David A. Shimp, Prospect, Ky., assignor to Celanese Corporation, New York, N.Y.

Filed Apr. 11, 1983, Ser. No. 483,981
Int. Cl.³ C08G 59/50, 59/68
U.S. Cl. 525—504 17 Claims

1. A curing agent for polyepoxide resins comprising a solution of:

(a) a sterically hindered aromatic diamine containing two primary amine groups attached directly to carbon atoms in the aromatic nucleus wherein the carbon atoms are not adjacent to each other and wherein each position ortho to each amine group contains an alkyl substituent having one to three carbon atoms; and

(b) copper fluoborate ps wherein the copper fluoborate is present in the solution in the amount of about 0.2 to about 5 weight percent based on the weight of (a) and (b).

9. A curable composition comprising:

(a) a sterically hindered aromatic diamine containing two primary amine groups attached directly to carbon atoms in the aromatic nucleus wherein the carbon atoms are not adjacent to each other and wherein each position ortho to each amine group contains an alkyl substituent having one to three carbon atoms;

(b) copper fluoborate; and

(c) a polyepoxide resin having more than one terminal 1,2-epoxy groups per molecule,

wherein the copper fluoborate is present in the amount of about 0.2 to about 5 weight percent based on the weight of (a) and (b) and wherein the hindered aromatic diamine and the polyepoxide resin are present in the equivalent ratios of about 0.5 to about 1.5 amine hydrogen atoms per 1 epoxy group.

4,447,587

PROCESS FOR THE PREPARATION OF A POLYOLEFIN, AND A CATALYST FOR THIS PROCESS

Joachim Berthold, Eppstein; Bernd Diedrich, Eschborn; Rainer Franke, Niedernhausen; Jürgen Hartlapp, Hattersheim am Main; Werner Schäfer, and Wolfgang Strobel, both of Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 14, 1982, Ser. No. 388,023
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1981, 3124223
Int. Cl.³ C08F 4/02, 10/02
U.S. Cl. 526—124 3 Claims

1. A process for the polymerization of ethylene or an olefin mixture comprising at least 70% by weight of ethylene and not more than 30% by weight of a 1-olefin of the formula $R_4CH{=}CH_2$ in which R^4 denotes an alkyl radical having 1 to 10 carbon atoms, in the presence of a catalyst comprised of the product from the reaction of a magnesium alcoholate of the formula $Mg(OR)_2$, in which R denotes identical or different alkyl radicals having 1 to 6 carbon atoms, with 1 to 5 moles titanium tetrachloride for each mole of magnesium alcoholate (component A) and an organometallic compound of Groups I to III of the periodic system (component B), which comprises carrying out the polymerization in the presence of a catalyst in which the component A has been prepared by a procedure in which, in a first reaction stage, a magnesium alcoholate has been reacted with titanium tetrachloride in a hydrocarbon at a temperature of 50° to 100° C., the reaction mixture formed is subjected, in a second reaction stage, to a heat treatment for a period of about 10 to 100 hours at a temperature of 110° to 200° C., with evolution of alkyl chloride until no further alkyl chloride is split off, and the solid is then freed from soluble reaction products by washing several times with a hydrocarbon.

4,447,588

ANAEROBICALLY-CURING COMPOSITIONS

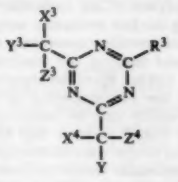
Anthony J. Rametta, White Bear Lake, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 203,682, Nov. 3, 1980, abandoned. This application Aug. 3, 1981, Ser. No. 289,703
Int. Cl.³ C08F 20/20
U.S. Cl. 526—301 14 Claims

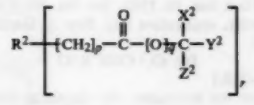
1. An anaerobically-curing composition, comprising

(A) a polymerizable monomer having at least one α,β-saturated carboxyl functionality per molecule of monomer;

(B) an effective amount of halogen-containing compound as a first initiator component and selected from the group consisting of halogenated triazines of the formula



wherein: X^3 and X^4 are each selected independently from the group consisting of H, CH_3, Cl, and Br; Y^3, Y^4, Z^3 and Z^4 are each independently selected from the group consisting of Cl and Br; and R^3 is selected from the group consisting of H and organic radicals comprising 1 to about 10 carbons; and compounds of the formula



wherein:

X^2 is selected from the group consisting of H, Cl, Br and CN;

Y^2 and Z^2 are each selected independently from the group consisting of Cl and Br;

R^2 is selected from the group consisting of amino residues and organic radicals comprising 1 to about 10 carbons;

p is 0 or 1;

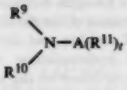
q is 0 or 1; and

r is 1 or 2;

(C) an effective amount of second initiator component selected from organic sulfimides, perfluoroalkyl sulfonanilides, secondary amines of the formula

wherein: R^4 and R^5 are each hydrocarbon groups comprising 1 to about 12 carbons; tertiary amines of the formula

wherein: R^6, R^7 and R^8 are in each hydrocarbon groups comprising 1 to about 12 carbons; and tertiary amines of the formula



wherein:

R^9 and R^{10} are each hydrocarbon groups comprising up to about 12 carbons;

A is a carbocyclic aromatic nucleus selected from the group consisting of phenyl and naphthyl radicals;

R^{11} is an organic radical group comprising up to about 5 carbons and is selected from the group consisting of alkyl and alkoxy radicals; and t is from 0 to 3 inclusive;

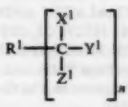
(D) a sufficient amount of an inhibitor of free-radical polymerization to retard polymerization of said adhesive composition while in the presence of air;

said composition being capable of polymerizing when placed in an anaerobically-curable environment.

11. An anaerobically-curing composition comprising:

(A) a polymerizable monomer having at least one α,β-saturated carboxyl functionality per molecule of monomer;

(B) an effective amount of halogen-containing compound as a first initiator component and selected from compounds of the formula



wherein:

x^1 is selected from the group consisting of H, CH_3, Cl and Br;

Y^1 and Z^1 are each selected independently from the group consisting of Cl and Br;

R^1 is selected from the group consisting of aromatic and heteroaromatic residues; and n is an integer from 1 to 3 inclusive;

(C) an effective amount of a second initiator component selected from compounds of the group consisting of organic sulfimides and perfluoroalkyl sulfonanilides;

(D) a sufficient amount of an inhibitor of free-radical polymerization to retard polymerization of said composition while in the presence of air;

said composition being capable of polymerizing when placed in an anaerobically-curable environment.

4,447,589

METHOD FOR PREPARING POLYAMIDE-IMIDE RESIN

Hiroshi Nishizawa, Kitaibaraki; Yoshiyuki Mukoyama, and Shozo Kasai, both of Hitachi, all of Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 4, 1982, Ser. No. 439,198

Claims priority, application Japan, May 28, 1982, 57-91768

Int. Cl.³ C08G *18/80*

U.S. Cl. 528—45 **18 Claims**

1. A process for producing a polyamide-imide resin which comprises reacting an aromatic diisocyanate with a tricarboxylic acid anhydride in approximately equimolar amounts in the presence of a basic solvent which is inert to the aromatic diisocyanate while adjusting the resin content at 40% by weight or more and adding a lactam containing an active hydrogen on the amide nitrogen in an amount of 0.1 to 1.0 mole per mole of the aromatic diisocyanate to the resulting reaction system before, during or after the reaction to mask terminal isocyanate groups and to make the reduced viscosity of the resin 0.10 to 0.27.

4,447,590

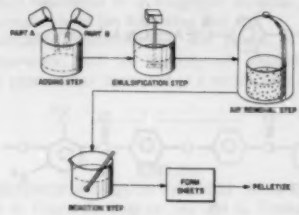
EXTRUDABLE POLYURETHANE FOR PROSTHETIC DEVICES PREPARED FROM A DIISOCYANATE, A POLYTETRAMETHYLENE ETHER POLYOL AND 1,4 BUTANE DIOL

Michael Szycher, Lynnfield, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Continuation of Ser. No. 316,922, Oct. 30, 1981, abandoned. This application Apr. 4, 1983, Ser. No. 479,922

Int. Cl.³ C08G *18/32*

U.S. Cl. 528—76 **1 Claim**



1. A polyurethane polymer to be used in molding devices for use in the human body and requiring a high degree of blood compatibility, said polymer being a polyurethane elastomer and the reaction product of:

(a) dicyclohexyl methane diisocyanate;

(b) a polytetramethylene ether polyol having a molecular weight in the range of 1000–2000; and

(c) 1,4 butane diol, wherein for each diol there are two dicyclohexyl methane diisocyanates and one glycol; and

the average molecular weight of the polymer is 120,000 units, and a weight average molecular weight of 315,000 molecular weight units.

4,447,591

POLYURETHANE

Shoji Watanabe, and Takuya Miho, both of Ohtake, Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed Feb. 23, 1982, Ser. No. 351,578

Claims priority, application Japan, May 8, 1981, 56-69077

Int. Cl.³ C08G *18/42, 63/10*

U.S. Cl. 528—80 **3 Claims**

1. A process for the preparation of polyurethanes which comprises reacting an organic diisocyanate with a polycaprolactone polyol having a narrow molecular weight distribution in which the ratio of the weight average molecular weight to the number average molecular weight is in the range of from 1.1 to 2.0 and the average molecular weight is 500 to 5,000, said polycaprolactone polyol having been prepared by subjecting a lactone to ring-opening polymerization in the presence of 0.1 to 50 ppm of stannous halide selected from the group consisting of stannous chloride, stannous bromide and stannous iodide, as a catalyst, and at a temperature of from 100° to 230° C.

4,447,592

ANISOTROPIC MELT POLYESTERS OF 6-HYDROXY-2-NAPHTHOIC ACID

John F. Harris, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

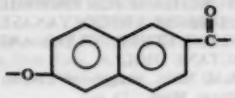
Filed Jun. 13, 1983, Ser. No. 503,651

Int. Cl.³ C08G *63/60*

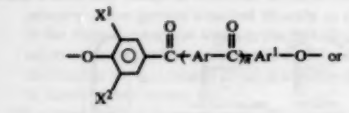
U.S. Cl. 528—128 **13 Claims**

1. Melt-processible polyester which is optically anisotropic in the melt phase and which consists essentially of the following molar amounts of the recurring units, with the sum of the molar amounts being 100%:

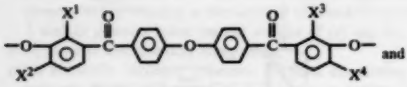
(a) about 20 to about 85%, of



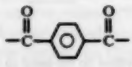
(b) about 15 to about 80% of approximately equimolar amounts of



(i)



and



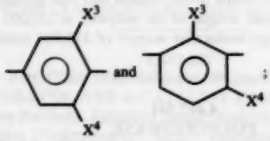
(ii)

wherein

each of X^1, X^2, X^3, and X^4 is independently selected from H, Cl, and CH_3;

Ar is selected from 1,4-phenylene, 1,3-phenylene, 4,4'-oxybiphenylene, 4,4'-biphenylene, and 2,6-naphthylene;

Ar^1 is selected from



and

n is 0 or 1.

4,447,593

MELT-ANISOTROPIC WHOLLY AROMATIC POLYESTER AND FIBERS OR FILMS THEREOF

Wataru Funakoshi, and Takanori Urasaki, both of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Aug. 17, 1982, Ser. No. 408,847

Claims priority, application Japan, Aug. 18, 1981, 56-128234; Sep. 11, 1981, 56-142406

Int. Cl.³ C08G *63/18, 63/60*

U.S. Cl. 528—176 **17 Claims**

1. A fiber-or film-forming wholly aromatic polyester having melt anisotropy, said polyester consisting essentially of

(1) units (a) of a divalent aromatic dicarboxylic acid residue, at least 90 mole% of said acid consisting of a p-oriented aromatic dicarboxylic acid and units (b) of a divalent aromatic dihydroxy compound residue, at least about 90 mole% of said compound consisting of a mono-substituted hydroquinone ring-substituted by an alkyl group having at least 5 carbon atoms or an aralkyl group having at least 7 carbon atoms or a mixture of said mono-substituted hydroquinone and unsubstituted hydroquinone or a substituted hydroquinone other than said mono-substituted hydroquinone, the proportion of said mono-substituted hydroquinone being at least 80 mole%; or

(2) said units (a) and (b), and units (c) of a divalent p-oriented aromatic hydroxycarboxylic acid residue, at least about 70 mole% of said hydroxycarboxylic acid consisting of p-hydroxybenzoic acid, a mono-substituted p-hydroxybenzoic acid ring substituted by an alkyl group having 1 to 4 carbon atoms or a halogen atom, or mixtures thereof, the proportion of the units of the divalent p-oriented aromatic dicarboxylic acid residue and the units of the divalent mono-substituted hydroquinone residue each being at least about 9 mole% based on the entire structural units of the polyester.

4,447,594

HEAT-CURABLE COMPOSITIONS COMPRISING ISOCYANURIC ACID-ACROLEIN DERIVATIVES

Saul M. Cohen, Springfield, and John R. LeBlanc, Wilbraham, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 21, 1981, Ser. No. 332,900

Int. Cl.³ C08G *2/00*

U.S. Cl. 528—245 **6 Claims**

1. A heat-curable coating composition comprising (1) about 50 to about 90 parts by weight of a polyunsaturated ester of an ethylenically unsaturated acid and a polyhydric alcohol, (2) about 10 to about 50 parts by weight of a polyaldehyde adduct formed from 1 mole of isocyanuric acid and from about 2 to about 3 moles of acrolein or a hemiacetal of the polyaldehyde adduct and a monohydric alcohol and (3) an effective amount of a free-radical or ionic initiator.

4,447,595

POLYTEREPHTHALATES AND COPOLYMERS THEREOF HAVING HIGH CLARITY AND PROCESS FOR MAKING SAME

Richard R. Smith, Cuyahoga Falls, and Mellis M. Kelley, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 7, 1982, Ser. No. 415,305

Int. Cl.³ C08G *63/04, 63/22, 63/16*

U.S. Cl. 528—274 **22 Claims**

1. A process for making a polyester having high clarity, comprising:

providing a quantity of one or more dicarboxylic compounds selected from the group consisting of a dicarboxylic acid or alkyl ester thereof having from 4 to 40 carbon atoms, and combinations thereof;

providing a quantity of one or more glycols selected from the group consisting of ethylene glycol, glycols having from 3 to 12 carbon atoms, glycol ethers having from 4 to 12 carbon atoms, and combinations thereof;

providing a protonic acid catalyst; and

reacting said dicarboxylic compound and said glycol in the presence of said protonic acid catalyst to form the polyesters;

wherein at least 50 mole percent of said dicarboxylic quantity is selected from the group consisting of terephthalic acid and alkyl esters thereof having from 10 to 20 carbon atoms;

wherein at least 50 mole percent of said glycol quantity is ethylene glycol; and

wherein said polyester has high clarity.

13. A polyester having high clarity, comprising the reaction product of;

a quantity of one or more dicarboxylic compounds selected from the group consisting of a dicarboxylic acid or alkyl ester thereof having from 4 to 40 carbon atoms, and combinations thereof;

a quantity of one or more glycols selected from the group consisting of ethylene glycol, glycols having from 3 to 12 carbon atoms, glycol ethers having from 4 to 12 carbon atoms, and combinations thereof; and

a protonic acid catalyst;

wherein at least 50 mole percent of said dicarboxylic quantity is selected from the group consisting of terephthalic acid and alkyl esters thereof having from 10 to 20 carbon atoms;

wherein at least 50 mole percent of said glycol quantity is ethylene glycol; and
wherein said polyester has high clarity.

4,447,596

METHOD OF PREPARING POLYAMIDE ACID FOR PROCESSING OF SEMICONDUCTORS

Daisuke Makino, Hitachi, and Yasuo Miyadera, Shimodate, both of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 54,429, Jul. 3, 1979, abandoned. This application Sep. 30, 1981, Ser. No. 307,199
Claims priority, application Japan, Jul. 11, 1978, 53-84295
Int. Cl.³ C08G 73/10
U.S. Cl. 528—353 4 Claims

1. A method of preparing polyamide acid useful for processing of semi-conductors from (i) at least one diamine and (ii) a tetracarboxylic acid dianhydride in an inert solvent, which comprises the steps of

(1) reacting (i) at least one diamine and (ii) a tetracarboxylic acid dianhydride, at a temperature below 40° C. to form a polyamide acid having a reduced viscosity above 0.5 dl/g at 30° C., and

(2) heating said polyamide acid in an inert solvent at a temperature between 50° C. and 100° C. and a trace of amount of water to lower the viscosity of said polyamide acid whereby the reducing viscosity of said polyamide acid is more than 0.3 dl/g at 30° C. and the solution viscosity of said polyamide acid in the inert solvent is 500 to 3,000 centipoises at 25° C.,

the reduced viscosity being measured by forming a 0.1 dl/g solution of said polyamide acid in dimethylsulfoxide and measuring the viscosity of the solution with a Ubbelohde's viscometer in accordance with Japanese Industrial Standard K 5400, and the solution viscosity being measured by measuring the viscosity of the solution of said polyamide acid in dimethylsulfoxide with a Brookfield type viscometer in accordance with Japanese Industrial Standard K 6901.

4,447,597

METHOD FOR ADJUSTING ARYLENE SULFIDE POLYMER CURE RATES

Ronald D. Mathis, and Jerry A. Reed, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 24, 1982, Ser. No. 422,787
Int. Cl.³ C08G 75/14
U.S. Cl. 528—388 9 Claims

1. A method for adjusting the cure rate of a first mixture of arylene sulfide polymer particles comprising:

(a) classifying particles from an uncured arylene sulfide polymer mixture by size groups;

(b) segregating size groups of classified particles to separate particles of relatively small size having a relatively slower rate of cure from particles of relatively larger size having a relatively faster rate of cure; and

(c) removing at least one size group of classified particles wherein the at least one size group removed comprises relatively large particles thereby rendering the cure rate of the remainder of the first mixture relatively slower than before removal of the classified particles.

4,447,598

METHOD OF PREPARING EPOXY RESINS HAVING LOW HYDROLYZABLE CHLORIDE CONTENTS

Terrence L. Caskey, Concord; Theodore L. Parker, Lafayette, and Patrick H. Martin, Danville, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 7, 1983, Ser. No. 482,760
Int. Cl.³ C08G 59/14
U.S. Cl. 528—489 11 Claims

1. The method of reducing the hydrolyzable chloride content of an epoxidation product, without substantially altering it otherwise, which comprises

(1) providing a two-phase mixture of

(a) an organic phase which is a solution of said product in a solvent having the characteristics of a blend of from about 40 to about 55 weight % methylethylketone and from about 60 to about 45 weight % toluene, and

(b) an aqueous solution of from about 1 to about 3 equivalents of base per equivalent of hydrolyzable chloride in said product, the amount of water in said solution being such that the base concentration therein will not be less than equivalent to 4 weight % aqueous NaOH after completion of the following step and

(2) intimately intercontacting said phases, at an elevated temperature, until the hydrolyzable chloride content of said product has decreased to a satisfactory extent.

4,447,599

THERMOTROPIC LIQUID CRYSTAL SHAPED ARTICLE

Frederic N. Cogswell, Welwyn, and Jiri G. Tomka, Harrogate, both of England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 40,452, May 18, 1979, Pat. No. 4,352,927. This application Apr. 2, 1982, Ser. No. 365,090
Claims priority, application United Kingdom, May 26, 1978, 22953/78; May 26, 1978, 22954/78
Int. Cl.³ C08J 7/00
U.S. Cl. 528—502 8 Claims

1. A thermotropic liquid crystalline shaped article fabricated from a rigid polymer, said rigid polymer being in the form of a thermotropic melt, according to the method comprising improving the processability of the rigid polymer by subjecting a melt of the rigid polymer to shear between relatively moving surfaces at an apparent shear rate of at least 100 sec^{-1}, whereby the viscosity of the melt is reduced and remains reduced after the shear between the relatively moving surfaces ceases to be applied, and fabricating the shaped article from the melt while the viscosity is so reduced.

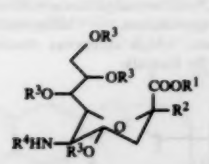
4,447,600

N-ACETYLNEURAMINIC ACID DERIVATIVES AND THE PREPARATION THEREOF

Haruo Ogura, Matsudo; Kimio Furuhata, Tokyo; Toshiaki Osawa, Akatsukashin; Satoshi Toyoshima, Tokyo; Yoshiyasu Shitori, Musashino, and Masayoshi Ito, Kunitachi, all of Japan, assignors to Kanto Ishi Pharmaceutical Co., Ltd., Japan

Filed May 20, 1982, Ser. No. 380,401
Claims priority, application Japan, May 22, 1981, 56-77672
Int. Cl.³ C07H 17/00
U.S. Cl. 536—23 5 Claims

1. N-acetylneuraminic acid derivatives of the general formula (I):



(I)

wherein R^1 represents hydrogen, lower alkyl or a lower alkyl substituted or non-substituted aralkyl or aryl group, R^2 is a nucleoside residue and R^3 and R^4 independently represent hydrogen or acetyl.

4,447,601

PROCESSED STARCH, PROCESS FOR PREPARING SAME AND USE OF SAME IN MEDICINES

Kimihiko Takeo; Tooichiro Hirano, and Fumihiko Sato, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 272,253, Jun. 10, 1981, Pat. No. 4,383,111. This application Sep. 27, 1982, Ser. No. 424,184

Claims priority, application Japan, Jun. 12, 1980, 55-79266

Int. Cl.³ C08L *3/02*; C08B *31/00*

U.S. Cl. 536—102 **10 Claims**

1. A processed starch derived from a terrestrial starch and consisting essentially of substantially non-birefringent starch powder which substantially retains a shell film structure of green starch granule, said starch powder having a particle size distribution substantially free of a fraction having a size of 48 Tyler standard sieve mesh or having a larger size and said starch powder having a bulk density of at least 0.25 g/cc, a cold water-soluble component content of less than 5% by weight, a swelling volume of about 3 to about 15 ml/g and a water retention of at least about 2.

4,447,602

PROCESS TO PREPARE 7-SUBSTITUTED CEPHALOSPORINS OR 6-SUBSTITUTED PENICILLINS

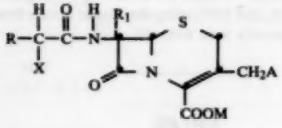
Raymond A. Firestone, Fanwood; Lovji D. Cama, Edison, and Burton G. Christensen, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 647,252, Jan. 7, 1976, abandoned, which is a continuation-in-part of Ser. No. 340,803, Mar. 13, 1973, abandoned, which is a continuation-in-part of Ser. No. 203,056, Nov. 29, 1971, abandoned. This application Jun. 3, 1977, Ser. No. 803,332

Int. Cl.³ C07D *501/04*, *499/04*

U.S. Cl. 544—21 **20 Claims**

11. The process of preparing the compound having the formula:



wherein

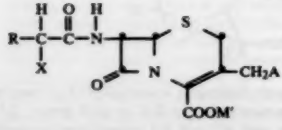
R is phenyl, thienyl or furyl;

X is hydrogen or amino;

M is sodium, potassium, benzyl, benzhydryl, trimethylsilyl, trichloroethyl, methoxymethyl, hydrogen, benzoylmethyl, or methoxybenzyl;

R_1 is hydroxy, mercapto, formyloxy, loweralkanoyloxy, loweralkoxy, loweralkylthio, azido, fluoro, chloro, bromo, or cyano; and

wherein A is hydrogen, loweralkanoyloxy, carbamoyloxy, thiocarbamoyloxy, N-loweralkylcarbamoyooxy, N-loweralkylthiocarbamoyloxy, N,N-diloweralkylcarbamoyloxy, N,N-diloweralkylthiocarbamoyloxy, pyridinium, alkylpyridinium, halopyridinium, or aminopyridinium; which comprises reacting the compound having the formula:



wherein R, X and A are as defined above, and M' is benzyl, benzhydryl, trimethylsilyl, trichloroethyl, methoxymethyl, benzoylmethyl, or methoxybenzyl;

(a) with approximately an equivalent of an organolithium compound chosen from the group consisting of phenyl lithium, tolyl lithium, alkyl lithium having 1–6 carbon atoms in the alkyl chain, or lithium alkylamide or lithium dialkylamide, alkyl having 1–6 carbon atoms in the alkyl chain at a temperature below about −20° C.

(b) then adding from about 1–3 equivalents of an active halogen transfer agent chosen from the group consisting of N-chloroacetamide, N-bromoacetamide, N-chlorosuccinimide, N-bromosuccinimide, t-butylhypochlorite, N-chlorosulfonamide, or α-chloromalonic ester;

(c) then either at said temperature below −20° C. or optionally after allowing the temperature to rise up to about 0° C.;

(d) adding about an equivalent of a hindered base lithium t-butoxide, diazobiscyclononane, diazobiscycloundecane, di-t-butyl-potassium phenoxide, 1,8-bis(dimethylamino)napthalene or N-lithiosuccinimide;

(e) adding about an equivalent amount of the reagent R_1Q, wherein R_1 is as defined above and Q is either hydrogen, triloweralkylammonium, or pyridinium, to yield the respective R_1 substituent, and recovering the desired product.

4,447,603

SUBSTITUTED-6-N-PROPYL-8-METHYLIMIDAZO[1,5-D]-AS-TRIAZIN-4-(3H)-ONES

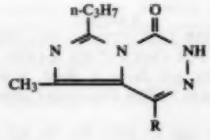
Rolf Paul, River Vale, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Feb. 4, 1981, Ser. No. 231,196

Int. Cl.³ A61K *31/53*; C07D *487/04*

U.S. Cl. 544—184 **7 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein R is methyl, ethyl or n-propyl; and the pharmaceutically acceptable acid-addition salts thereof.

4,447,604

THIAZOLOTRIAZINE DERIVATIVES

John L. Archibald, Farnham Royal, and John T. A. Boyle, Cookham, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Filed Apr. 1, 1982, Ser. No. 364,561

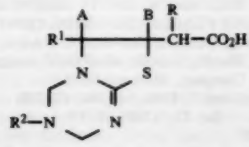
Claims priority, application United Kingdom, Apr. 10, 1981, 8111371

Int. Cl.³ C07D *513/04*

U.S. Cl. 544—219 **13 Claims**

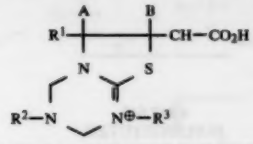
1. A compound selected from

(a) thiazolotriazine derivatives having the formula I



and their pharmaceutically acceptable salts and

(b) thiazolotriazinium compounds comprising a cation having the formula II



(II)

and a pharmaceutically acceptable anion and their zwitterionic forms and pharmaceutically acceptable acid addition salts; wherein

A is hydroxy whilst B is hydrogen or A and B together represent a direct bond;

R^1 represents aryl; R^2 is selected from lower alkyl and lower alkyl monosubstituted by aryl; R^3 (where present) is selected from lower alkyl and lower alkyl monosubstituted by aryl; and each aforesaid aryl is independently selected from unsubstituted phenyl and phenyl substituted by up to two substituents selected from halogen, trifluoromethyl, lower alkoxy, lower alkyl, nitro, amino, mono- and di-(lower alkyl) amino, cyano, lower alkylsulfonyl, lower alkylsulfinyl, sulfamoyl and carbamoyl.

4,447,605

DI(TRI-LOWER ALKYLSTANNYL)PYRIMIDINE DERIVATIVE AND A PROCESS FOR PRODUCING THE SAME

Masanao Matsui, Tokyo, and Tomoya Ogawa, Musashino, both of Japan, assignors to Rikagaku Kenkyusho, Wako, Japan

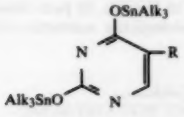
Division of Ser. No. 735,777, Oct. 28, 1976, Pat. No. 4,324,895. This application Jul. 28, 1981, Ser. No. 287,642

Claims priority, application Japan, Oct. 24, 1975, 50-128020; Oct. 24, 1975, 50-128022; Dec. 4, 1975, 50-144637; Jan. 5, 1976, 51-180; Mar. 15, 1976, 51-27836; Mar. 15, 1976, 51-27837; May 11, 1976, 51-53463

Int. Cl.³ C07D *239/52*

U.S. Cl. 544—225 **2 Claims**

1. A di(tri-lower alkylstannyl)pyrimidine derivative having the general formula:



wherein Alk stands for a lower alkyl radical and R for a hydrogen or fluorine or bromine atom or a lower alkyl radical.

4,447,606

HYDROXY AND HYDROPEROXY TETRAHYDROPYRIMIDINES

Bernardus A. Oude Alink, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Apr. 9, 1979, Ser. No. 28,149

Int. Cl.³ C07D *239/72*

U.S. Cl. 544—231 **5 Claims**

1. 5-hydroperoxy, 5-hydroxy or mixtures thereof derivatives of 2,2,4,4-dipentamethylene 5,6-tetramethylene 2,3,4,5-tetrahydropyrimidines.

3. A process of preparing the 5-hydroxy tetrahydropyrimidines of claim 1 which comprises reacting 2,2,4,4-dipentamethylene 5,6-tetramethylene 2,3,4,5-tetrahydropyrimidines with oxygen in the presence of trialkyl (or triaryl) phosphites.

4,447,607

DIBENZO DIAZACINES

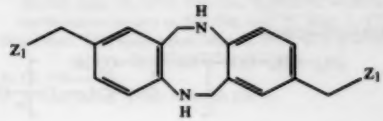
Roy A. Johnson, Brookline, Mass., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 5, 1982, Ser. No. 439,481

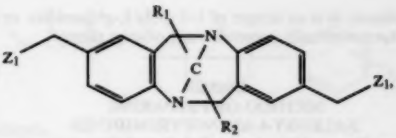
Int. Cl.³ C07D *239/70*

U.S. Cl. 544—246 **7 Claims**

1. A compound of the formula I or II



I



II

or a pharmaceutically acceptable acid addition salt thereof, wherein Z_1 is

(a) 3- or 4-pyridyl, or

(b) 1-imidazolyl;

wherein R_1 and R_2 are the same or different and are

(a) hydrogen,

(b) $(C_1–C_4)$alkyl,

(c) phenyl,

(d) phenyl mono-, di-, or tri-substituted by

(i) $(C_1–C_4)$alkyl,

(ii) a halogen atom,

(iii) hydroxyl,

(iv) amino

(v) an amine of the formula, $—NR_3R_4$, wherein R_3 and R_4 are the same or different and are hydrogen or $(C_1–C_4)$alkyl,

(vi) cyano,

(vii) hydroxy-carbonyl

(viii) $(C_1–C_4)$alkoxy carbonyl,

(ix) nitro, or

(x) $(C_1–C_4)$alkoxy,

(e) $(C_7–C_{12})$aralkyl, or

(f) 3-pyridyl or 1-imidazolyl.

4,447,608

ANTI-CANCER QUINAZOLINE DERIVATIVES

Terence R. Jones, Sutton; Kenneth R. Harrap, Newdigate, and Alan H. Calvert, London, all of England, assignors to National Research Development Corporation, London, England

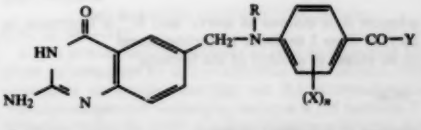
Continuation of Ser. No. 214,024, Dec. 8, 1980, abandoned. This application Oct. 19, 1982, Ser. No. 435,215

Claims priority, application United Kingdom, Dec. 19, 1979, 7943715; Feb. 28, 1980, 8006813

Int. Cl.³ C07D *239/84*; A61K *31/505*

U.S. Cl. 544—287 **7 Claims**

1. A compound of formula:



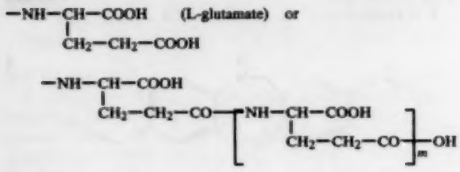
(I)

wherein

R represents a straight or branched chain unsaturated $C_2–C_4$ hydrocarbon group,

n is 0, 1 or 2;

X, which is linked in a position ortho to the —CO—Y group, represents a halogeno or C_1–C_4 alkyl group, and where two X's are present these may be the same or different; and Y represents a group of formula:



wherein m is an integer of 1–9 (poly-L-glutamates); or a pharmaceutically acceptable salt or ester thereof.

4,447,609

METHOD OF PREPARING 2-ALKOXY-4-AMINOPYRIMIDINES

Hermann Peeters, Niederkassel, Fed. Rep. of Germany, assignor to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

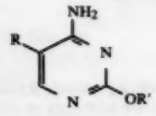
Filed Mar. 17, 1982, Ser. No. 358,973

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1981, 3111613

Int. Cl.³ C07D *239/24*

U.S. Cl. 544—317 **16 Claims**

1. Process for preparing 2-alkoxy-4-aminopyrimidine compounds of the formula:



1

wherein

R is hydrogen, alkyl of from 1 to about 20 carbon atoms, or a straight or branched moiety selected from the group consisting of

$(CH_2)_nCN$

$(CH_2)_n—COOR''$,

$(CH_2)_n—NH_2$,

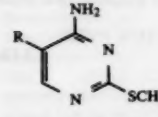
$(CH_2)_nOR''$, and

benzyl;

R'' is an alkyl moiety of from 1 to about 12 carbon atoms or a univalent phenol moiety;

n is an integer from 1 to 5 and

R' is straight chain or branched alkyl of from 1 to about 10 carbon atoms; by reacting a 4-amino-2-carboxymethyl-thiopyrimidine of the formula:



2

wherein R is defined as above, and R''' is hydrogen or alkyl of from 1 to about 10 carbon atoms

with an excess of alcohol of the formula:

HOR'

wherein R' is defined as above,

in the presence of a base having the following formula:

XOR^4

wherein X is an alkali or alkaline earth metal and R^4 is hydrogen, or an alkyl having from 1 to about 10 carbon atoms, in an amount sufficient to form an alkaline reaction mixture.

4,447,610

10-SUBSTITUTED 5-CYANOMETHYLENE-DIBENZO[a,b]-CYCLOHEPTENES, THEIR PREPARATIONS, AND THERAPEUTIC AGENTS CONTAINING THESE COMPOUNDS

Gerd Steiner, Kirchheim; Hans P. Hofmann, Ludwigshafen; Horst Kreiskott, Wachenheim; Hans-Juergen Teschendorf, and Dieter Lenke, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

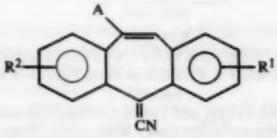
Filed Feb. 25, 1981, Ser. No. 237,962

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1980, 3009034

Int. Cl.³ C07D *295/14, 223/02, 211/34*

U.S. Cl. 544—381 **15 Claims**

1. A 10-substituted 5-cyanomethylene-dibenzo[a,d]-cycloheptene of the formula I



(I)

where R^1 and R^2 are hydrogen, halogen, alkyl of 1 to 3 carbon atoms or trifluoromethyl, and A is an amino radical $—NR^4R^5$, where R^4 and R^5 together with the nitrogen atom by which they are linked form a piperidine, piperazine or homopiperazine ring, the second nitrogen atom where present being unsubstituted or substituted by alkyl of 1 to 3 carbon atoms, hydroxyalkyl of 2 or 3 carbon atoms, alkoxyalkyl, the alkoxy and alkyl radical each being of 1 to 3 carbon atoms, cycloalkyl or cycloalkylmethyl, of 3 to 7 carbon atoms in the cycloalkyl ring, or alkynyl of 2 to 5 carbon atoms, and may be further substituted by oxygen in the form of an N-oxide, its pure cis-isomer and trans-isomer, and its physiologically tolerated addition salts with acids.

4,447,611

BENZO-FUSED AND HETEROCYCLIC FUSED IMIDAZOLE ANTI-ULCER AGENTS

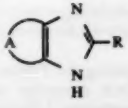
Dieter H. Klaubert, Perkiomenville, and Stanley C. Bell, Penn Valley, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed May 27, 1982, Ser. No. 382,494

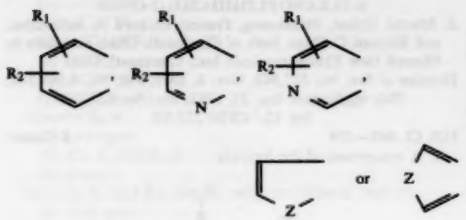
Int. Cl.³ C07D *471/04*

U.S. Cl. 546—118 **3 Claims**

1. A compound having the formula



wherein A is a moiety of the formula

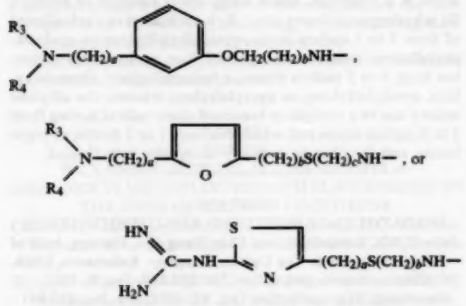


in which

R_1 and R_2 may be hydrogen, lower alkyl, lower alkoxy, halogen or thioalkyl; and

Z is O or S;

R is an amine selected from the group



wherein

R_3 and R_4 may be hydrogen, lower alkyl, cycloloweralkyl or R_3 and R_4 taken together form a piperidinyl ring;

a=b=c=1–5; and

pharmaceutically acceptable salts thereof.

4,447,612

CATALYSTS FOR THE PRODUCTION OF 3-CYANOPYRIDINE

Helmut Beschke; Heinz Friedrich, both of Hanau, and Johannes Heilos, Seligenstadt, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Feb. 23, 1982, Ser. No. 351,402

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1981, 3107755

Int. Cl.³ C07D *213/57*

U.S. Cl. 546—285 **16 Claims**

1. A process for the preparation of 3-cyanopyridine comprising heat reacting in the gas phase 3-methylpyridine with ammonia and oxygen in the presence of a catalyst consisting essentially of the elements antimony, vanadium and oxygen and additionally at least one of the elements iron, copper, titanium, cobalt, manganese, and nickel where the atomic ratio of antimony to vanadium is greater than 1 and which contains in addition to these compounds a lattice layer silicate and highly dispersed silica and which has a BET surface area of 5 to 50 m^2/g, a macropore volume of 0.1 to 0.8 cm^3/g, and an average pore radius of 1 to 8×10^{-7} cm.

4,447,613

PYRIDYL ESTERS AND THIOLESTERS OF AMINOALKANOIC ACIDS

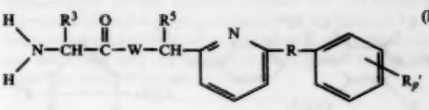
Clive A. Henrick, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Continuation of Ser. No. 220,335, Dec. 29, 1980, abandoned, which is a division of Ser. No. 158,834, Jun. 12, 1980, Pat. No. 4,269,981, which is a division of Ser. No. 78,525, Sep. 24, 1979, Pat. No. 4,247,701, which is a continuation-in-part of Ser. No. 69,445, Aug. 24, 1979, Pat. No. 4,226,872, which is a continuation-in-part of Ser. No. 16,775, Mar. 2, 1979, abandoned. This application Mar. 8, 1982, Ser. No. 355,792

Int. Cl.³ C07D *213/64*

U.S. Cl. 546—300 **5 Claims**

1. A compound of the formula (IV'):



(IV')

wherein,

W is oxygen or sulfur;

p is zero, one or two;

R is oxygen, sulfur, methylene or carbonyl;

R^3 is lower alkyl of 2 to 5 carbon atoms, lower alkenyl of 2 to 5 carbon atoms or lower cycloalkyl of 3 to 4 carbon atoms;

R^5 is hydrogen, cyano, methyl, ethyl, ethynyl or Trifluoromethyl; and

R' is fluoro, bromo, chloro, trifluoromethyl, methyl, methoxy or methylthio.

4,447,614

PROCESS FOR THE PURIFICATION OF NICOTINIC ACID AMIDE

Helmut Beschke, Hanau; Franz-Ludwig Dahm, Alzenau; Heinz Friedrich, and Günter Prescher, both of Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 29, 1981, Ser. No. 288,187

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1980, 3028791

Int. Cl.³ C07D *211/72, 211/84, 213/56*

U.S. Cl. 546—316 **19 Claims**

1. In a process for the recovery of pure nicotinamide from a crude nicotinamide by recrystallization in an alkanol the improvement comprising using 2-methylpropanol-1 containing water as the solvent and treating the warm solution present after dissolving the nicotinamide with an ion exchanger.

4,447,615

PROCESS FOR THE PURIFICATION OF NICOTINIC ACID AMIDE I

Helmut Beschke, Hanau; Franz-Ludwig Dahm, Alzenau; Heinz Friedrich, and Günter Prescher, both of Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jul. 29, 1981, Ser. No. 288,186

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1980, 3028904

Int. Cl.³ C07D *211/72, 211/84, 213/56*

U.S. Cl. 546—317 **16 Claims**

1. In a process for the recovery of pure nicotinamide from a crude nicotinamide by recrystallization in an alcohol, the improvement comprising carrying out the recrystallization in 2-methyl-propanol-1 containing water at a pH between 7 and 10 and including the steps of at least once recycling the mother liquor from the recrystallization of the crude nicotinamide, heating the mother liquor, adding further crude nicotinamide to the heated mother liquor, cooling the mother liquor contain-

ing said further crude nicotinamide sufficiently to recrystallize the crude nicotinamide in purer form.

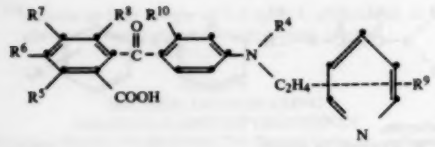
4,447,616

PYRIDINE CONTAINING BENZOIC ACID DERIVATIVES

William M. Hung, and Edward E. Ehlinger, both of Cincinnati, Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Filed Nov. 30, 1982, Ser. No. 445,537
Int. Cl.³ C07D *213/30*
U.S. Cl. 546—335 **2 Claims**

1. A 2-{2-R[10]-4-N-[2-(R[9]-pyridyl)ethyl]-N-R[4]-aminophenyl}carbonyl-3-R[8]-4-R[7]-5-R[6]-6-R[5]-benzoic acid having the formula



wherein:

R^4 represents hydrogen, non-tertiary C_1 to C_4 alkyl, benzyl or benzyl substituted in the benzene ring by one or two of halo, non-tertiary C_1 to C_4 alkyl, non-tertiary C_1 to C_4 alkyl, non-tertiary C_1 to C_4 alkoxy or nitro;

R^5, R^6, R^7 and R^8 each independently represent hydrogen, halo, or when R^5, R^8 and one of R^6 and R^7 represents hydrogen, the other of R^6 and R^7 represents COOH

R^9 represents hydrogen, or non-tertiary C_1 to C_4 alkyl; and

R^{10} represents hydroxy or C_1 to C_3 alkoxy.

4,447,617

PROCESS FOR THE PREPARATION OF 2-AMINO-6-NITROBENZOTHIAZOLE

R. Donald Clark, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 14, 1982, Ser. No. 368,240
Int. Cl.³ C07D *277/82*
U.S. Cl. 548—164 **9 Claims**

1. Process for the preparation of 2-amino-6-nitrobenzothiazole which comprises contacting a mixture of 2-mercapto-6-nitrobenzothiazole and ammonia with hydrogen peroxide.

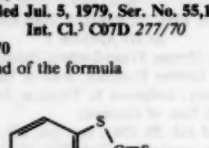
4,447,618

N-SUBSTITUTED THIOXOBENZOTHIAZOLINES

John J. D'Amico, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 5, 1979, Ser. No. 55,103
Int. Cl.³ C07D *277/70*
U.S. Cl. 548—170 **4 Claims**

1. A compound of the formula



wherein:

n is 1 or 2;

R is hydrogen, $C_{1\text{-}5}$ alkyl, halo $C_{1\text{-}5}$ alkyl, $C_{2\text{-}5}$ alkenyl, halo $C_{2\text{-}5}$ alkenyl, or agriculturally acceptable salts; provided that when n is equal to 1, R may not equal hydrogen or ethyl.

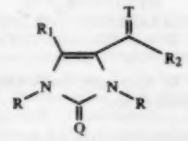
4,447,619

4-ALKANOYLIMIDAZOL-2-ONES

J. Martin Grisar, Strasbourg, France; Richard A. Schnettler, and Richard C. Dage, both of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 317,962, Nov. 4, 1981, Pat. No. 4,367,236. This application Sep. 27, 1982, Ser. No. 424,821
Int. Cl.³ C07D *233/04*
U.S. Cl. 548—318 **6 Claims**

1. A compound of the formula



wherein Q and T are each an oxygen atom or a divalent sulfur atom; R is hydrogen, lower alkyl, lower alkanoyl or benzoyl; R_1 is hydrogen or lower alkyl; R_2 is cycloalkyl or cycloalkenyl of from 3 to 7 carbon atoms, cycloalkylalkylene or cycloalkenylalkylene wherein the cycloalkyl or cycloalkenyl moiety has from 3 to 7 carbon atoms, a furanylalkylene, thienylalkylene, pyridylalkylene, or pyrrylalkylene wherein the alkylene moiety can be a straight or branched chain radical having from 1 to 6 carbon atoms and which can have 1 or 2 double or triple bonds; and the pharmaceutically acceptable salts thereof.

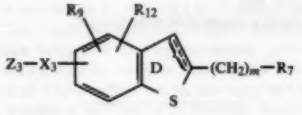
4,447,620

IMIDAZOLYL-SUBSTITUTED BENZOTHIOPHENES

John C. Sih, Kalamazoo, and Chiu-Hong Lin, Portage, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 385,619, Jun. 8, 1982, abandoned. This application Oct. 12, 1982, Ser. No. 433,941
Int. Cl.³ C07D *409/06*
U.S. Cl. 548—336 **2 Claims**

1. A compound of the formula I



I

wherein Z_3 is

(a) 1-imidazolyl, or

(b) 1-imidazolyl substituted by (C_1–C_3)alkyl;

wherein X_3 is

(a) —$(CH_2)_n$—,

(b) —CHOH—, or

(c) —C(O)—;

with the proviso that when X_3 is —$(CH_2)_n$— and n is not zero, Z_3 is 1-imidazolyl substituted by (C_1–C_3)alkyl and Z_3X_3— is attached to the 4-position of the benzofuran,

wherein R_1 is hydrogen, a pharmacologically acceptable cation, (C_1–C_{12}) alkyl, (C_3–C_{10}) cycloalkyl, (C_7–C_{12}) aralkyl, phenyl, phenyl mono-, di-, or trisubstituted by chloro, (C_1–C_3) or alkyl, or phenyl para-substituted by

(a) —NHCO—R_{25},

(b) —O—CO—R_{26},

(c) —CO—R_{24},

(d) —O—CO—(p—Ph)—R_{27}, or

(e) —CH=N—NH—CO—NH_2,

wherein R_{24} is phenyl or acetamidophenyl, R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or amino, R_{26} is methyl, phenyl, amino or methoxy; and R_{27} is hydrogen or acetamido, and wherein —(p—Ph) is 1,4-phenylene;

wherein R_7 is

(a) hydrogen,
(b) —CH_2OH,
(c) —$COOR_1$,
(d) —$CH_2N(R_4)_2$,
(e) —CN
(f) —$CON(R_4)_2$, or
(g) —C(O)—R_4;
wherein R_4 is
(a) hydrogen,
(b) (C_1–C_4)alkyl, or
(c) phenyl;
wherein R_9 and R_{12} are the same or different and are
(a) hydrogen,
(b) (C_1–C_4)alkyl
(c) fluoro,
(d) chloro,
(e) bromo,
(f) —OCH_3, or,
(g) when taken together and attached to contiguous carbon atoms, —O—CH_2—O—;
wherein D represents a single or a double bond;
wherein m and n are the same or different and are the integers 0 to 4, inclusive; including, a pharmacologically acceptable acid addition salt thereof; and
when D represents a single bond, an enantiomer or a racemic mixture of enantiomers thereof.

4,447,621

USE OF N-CYANO-N'-METHYL-N''-[2-(5-METHYL-4-IMIDAZOLYLMETHYLDITHIO)ETHYL]GUANIDINE IN THE PREPARATION OF CIMETIDINE

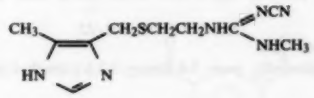
Clifford S. Labaw, Philadelphia, and George R. Wellman, Wayne, both of Pa., assignors to SK&F Lab Co., Carolina, P.R.

Division of Ser. No. 270,076, Jun. 3, 1981, Pat. No. 4,374,996. This application Oct. 21, 1982, Ser. No. 435,807

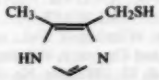
Int. Cl.³ C07D *233/66*

U.S. Cl. 548—342 **5 Claims**

1. A process for preparing the compound of the formula:

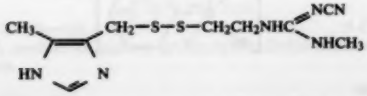


which comprises oxidizing a mixture of a mercaptomethylimidazole compound of the formula:



and a mercaptoethylguanidine compound of the formula:

in a basic solution and treating the resulting disulfide compound of the formula:



with a phosphine.

4,447,622

PREPARATION OF L- AND D-ISOMERS OF DL-3,4-TRANS-2,2-DISUBSTITUTED-3,4-DIARYLCHROMANS AND DERIVATIVES THEREOF

Mohammad Salman; Suprabhat Ray; Ved P. Kamboj, and Nitya Anand, all of Lucknow, India, assignors to Council of Scientific and Industrial Research Rafi Marg, New Delhi, India

Filed Sep. 22, 1981, Ser. No. 304,507

Int. Cl.³ C07D *405/12, 311/74*

U.S. Cl. 548—525 **2 Claims**

1. A process for the preparation of l-3,4-trans-2,2-dimethyl-3-phenyl-4-[p-(β-pyrrolidinoethoxy)]phenyl-7-methoxychroman or active l-acid salts thereof, which comprises reacting dl-3,4-trans-2,2-dimethyl-3-phenyl-4-[p-(β-pyrrolidinoethoxy)]phenyl-7-methoxy chroman with di-p-toluoyl-l-tartaric acid monohydrate in a protic solvent to produce on fractional crystallisation of the reaction mixture the l-3,4-trans-2,2-dimethyl-3-phenyl-4-[p-(β-pyrrolidino-ethoxy)]phenyl-7-methoxy chroman-l-acid salt of said tartaric acid monohydrate and subjecting said crystalline salt to alkaline hydrolysis to obtain the desired l-isomer.

4,447,623

PROCESS FOR THE PREPARATION OF 4,5-DICHLORO-1,2-DITHIACYCLOPENTEN-3-ONE

Rolf Müller, Karben, and Herbert Wille, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 24, 1982, Ser. No. 422,843

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1982, 3201761

Int. Cl.³ C07D *339/04*

U.S. Cl. 549—36 **9 Claims**

1. In the process for preparation of 4,5-dichloro-1,2-dithiacyclopenten-3-one by reacting hexachloropropene with sulphur at elevated temperatures, the improvement comprises simultaneously hydrolyzing by-product sulphur chlorides by conducting the reaction in the presence of water at a temperature of about 150° to 210° C.

4,447,624

PREPARATION OF THIOPHENES

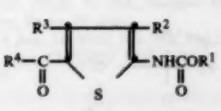
James J. Krutak, and Robert J. Maleski, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 181,923, Aug. 27, 1980, abandoned. This application Jun. 21, 1982, Ser. No. 390,490

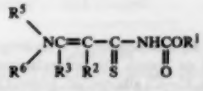
Int. Cl.³ C07D *333/36*

U.S. Cl. 549—69 **5 Claims**

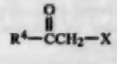
1. A process for the preparation of a thiophene having the formula



which comprises reacting an enamine having the formula



with a ketone having the formula



wherein

R^1 is an alkyl, cycloalkyl or aryl;

R^2 is hydrogen, an alkyl, cycloalkyl or aryl radical, alkoxycarbonyl, substituted alkoxycarbonyl, carboxyl, cyano, carbamoyl, N-alkylcarbamoyl, N,N-dialkylcarbamoyl, N-carbocyclic arylcarbamoyl, alkanoyl, carbocyclic aroyl, piperidinocarbonyl, morpholinocarbonyl, sulfamoyl, N-alkylsulfamoyl, N,N-dialkylsulfamoyl, N-carbocyclic arylsulfamoyl, alkylsulfonyl, carbocyclic arylsulfonyl, piperidinosulfonyl, morpholinosulfonyl, alkylsulfinyl, carbocyclic arylsulfinyl, piperidinosulfinyl or morpholinosulfinyl radical;

R^3 is hydrogen or an alkyl, cycloalkyl or carbocyclic aryl radical;

R^4 is an alkyl, cycloalkyl or carbocyclic aryl radical;

R^5 and R^6 are alkyl radicals or together R^5 and R^6 are tetramethylene, pentamethylene or 3-oxapentamethylene; and

X is chloro or bromo.

4,447,625

1,3-DIOXOLAN-5-ONE DERIVATIVES

Walter Kunz, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

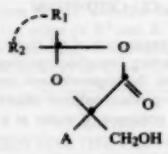
Division of Ser. No. 280,387, Jul. 6, 1981, Pat. No. 4,384,879. This application Sep. 23, 1982, Ser. No. 422,314

Claims priority, application Switzerland, Jul. 15, 1980, 5412/80

Int. Cl.³ C07D *317/72, 317/34*

U.S. Cl. 549—265 **2 Claims**

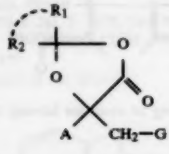
1. A compound of the formula V



(V)

wherein each of R_1 and R_2 independently is hydrogen, C_1–C_4alkyl, unsubstituted or mono- or polysubstituted by halogen, C_1–C_4alkoxy, C_1–C_4alkylthio, phenyl or phenoxy, or is phenyl, all of which phenyl radicals are unsubstituted or mono- or polysubstituted by halogen, nitro, trifluoromethyl, C_1–C_4alkyl or methoxy, or R_1 and R_2 together form a 3- to 7-membered cycloalkyl ring which is unsubstituted or substituted by halogen, C_1–C_4alkyl, C_1–C_4alkoxy or C_1–C_3alkylthio, and A is a phenyl radical, unsubstituted or mono- or polysubstituted by halogen, trifluoromethyl, nitro, C_1–C_4alkyl, C_1–C_4alkoxy or phenyl.

2. A compound of the formula VI



(VI)

wherein

each of R_1 and R_2 independently is hydrogen, C_1–C_8 alkyl, unsubstituted or mono- or polysubstituted by halogen, C_1–C_4 alkoxy, C_1–C_4 alkoxythio, phenyl or phenoxy, or is phenyl, all of which phenyl radicals are unsubstituted or mono- or polysubstituted by halogen, nitro, trifluoromethyl, C_1–C_4 alkyl or methoxy, or R_1 and R_2 together form a 3- to 7-membered cycloalkyl ring which is unsubstituted or substituted by halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy or C_1–C_3 alkylthio;

A is a phenyl radical, unsubstituted or mono- or polysubstituted by halogen, trifluoromethyl, nitro, C_1–C_4 alkyl, C_1–C_4 alkoxy or phenyl; and

G is C_1–C_6 acyloxy, benzenesulfonyloxy, p-bromobenzenesulfonyloxy, p-tosyloxy, C_1–C_6alkylsulfonyloxy, chlorine or bromine.

4,447,626

ML-236B DERIVATIVES

Akira Terahara, and Minoru Tanaka, both of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

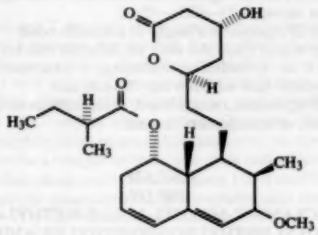
Filed Jul. 7, 1982, Ser. No. 395,968

Claims priority, application Japan, Jul. 21, 1981, 56-114038

Int. Cl.³ C07D *309/30*

U.S. Cl. 549—292 **1 Claim**

1. The compound having the following formula (I):



4,447,627

ALIPHATIC EPOXY-KETONE

Regula Näf, Carouge; Anthony F. Morris, Gingins, and Ferdinand Näf, Carouge, all of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Filed Apr. 22, 1982, Ser. No. 370,870

Claims priority, application Switzerland, Jun. 11, 1981, 3822/81

Int. Cl.³ C07D *303/32*

U.S. Cl. 549—548 **1 Claim**

1. Substantially pure 5,6-Epoxy-3,3,6-trimethyl-hept-1-en-4-one.

4,447,628

NONHYGROSCOPIC, ANIONIC PENTACOORDINATE SILICATE

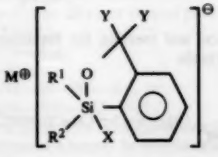
William B. Farnham, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 12, 1982, Ser. No. 397,212

Int. Cl.³ C07F *7/08, 7/10, 7/18*

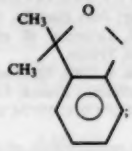
U.S. Cl. 556—415 **7 Claims**

1. Nonhygroscopic, anionic, pentacoordinate silicate of the formula



wherein

R^1 and R^2 are both aryl or one is aryl and the other is C_{1-4} alkyl, or R^1 and R^2 taken together are



Y is CF_3 or, when R^1 and R^2 are taken together, CH_3;
X is F, CN or N_3 when Y is CF_3;
X is F when Y is CH_3;
$M^{\oplus}$ is $(R^3)_4N^{\oplus}$, $[(R^4)_2N]_3S^{\oplus}$ or $Cs^{\oplus}$ when X is F;
$M^{\oplus}$ is $(R^5)_4N^{\oplus}$ when X is CN;
$M^{\oplus}$ is $[(R^4)_2N]_3S^{\oplus}$ or $(R^5)_4N^{\oplus}$
when X is N_3;
aryl is phenyl, phenyl substituted with F or C_{1-4} alkyl, C_{1-4} alkoxy or naphthyl;
R^3 is C_{1-4} alkyl;
R^4 is C_{1-2} alkyl or $(R^4)_2$ is $-(CH_2)_5-$; and
R^5 is C_{2-4} alkyl.

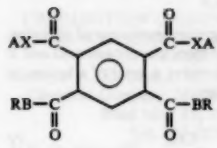
4,447,629

FLUORINATED AND NON-FLUORINATED SILOXY PYROMELLITATES

Bryce C. Oxenrider, Florham Park, and David J. Long, Stanhope, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

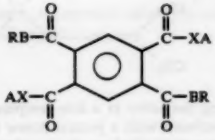
Filed Sep. 30, 1982, Ser. No. 429,946
Int. Cl.³ C07F 7/08, 7/10, 7/18
U.S. Cl. 556—419 **6 Claims**

1. A monocyclic compound having the structure:



(I)

or



(II)

or mixtures thereof wherein X is independently at each occurrence —O—, —S—, —N(CH₃)— or —NH—; wherein A is alkyl of 2–24 carbons or R′—$(CF_2)_pCF_3$ with R′ being alkylene of 1–6 carbons and p being an integer of 3–15; wherein B is —S—, —NH—, or —N(CH₃)— and where R is a monovalent radical of the structure —$(CH_2)_q$—Si(OR″)₃, with q being an integer of 1 to 8, and R″ being alkyl of 1–3 carbons.

4,447,630

METHOD FOR MAKING CYCLOPOLYDIMETHYLSILOXANES

Robert E. Williams, Jr., Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 29, 1983, Ser. No. 527,539
Int. Cl.³ C07F 7/08
U.S. Cl. 556—460 **4 Claims**

1. A method for making cyclopolydimethylsiloxanes of the formula

$[(CH_3)_2SiO]_m$

which comprises,

(A) hydrolyzing dimethyldichlorosilane in an aqueous reaction medium in the presence of an effective amount of a perfluoroalkyl sulfonic acid salts of the formula

$(C_xF_{2x+1})SO_3M$

and

(B) recovering the cyclopolydimethylsiloxane from the mixture of (A),

where M is an alkali metal, or a tetralkylammonium radical, x is 6 to 16 and m is a whole number equal to from 3–6 inclusive.

4,447,631

REDISTRIBUTION OF TETRAMETHYLSILANE/DIMETHYLDICHLOROSILANE INTO TRIMETHYLCHLOROSILANE

Alphonse Faure, Vienne, and Robert Magne, Roussillon, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed May 12, 1980, Ser. No. 148,587
Claims priority, application France, May 10, 1979, 79 11837
Int. Cl.³ C07F 7/12
U.S. Cl. 556—469 **11 Claims**

1. A process for the redistribution of a tetramethylsilane and dimethyldichlorosilane admixture into trimethylchlorosilane, comprising contacting such admixture, in vapor phase, with a catalytically effective amount of a catalyst selected from the group consisting of granular anhydrous aluminum chloride and mixtures thereof with a hydrogen-chlorosilane having the formula $(CH_3)_aHSiCl_{3-a}$, where a is 0, 1 or 2, at a temperature ranging from about 75° C. to 120° C.

4,447,632

PROCESS FOR PRODUCTION OF ALKYL SILICATES FROM SILICON METAL

Charles B. Mallon, Belle Mead, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Apr. 18, 1983, Ser. No. 485,822
Int. Cl.³ C07F 7/18, 7/04
U.S. Cl. 556—470 **8 Claims**

1. Process for production of alkyl silicates from silicon metal which comprises contacting finely divided silicon metal with a mixture of methanol and ethanol containing at least 10% methanol by weight at a temperature of at least about 130° C. in the presence of a catalytic amount of a carbonate or bicarbonate of an alkali metal until methyl orthosilicate, ethyl orthosilicate and mixtures of methyl ethyl silicates are formed.

4,447,633

ULTRASONICALLY PROMOTED HYDROSILATIONS

Philip R. Boudjouk, Fargo, N. Dak., assignor to North Dakota State University, Fargo, N. Dak.

Filed Jun. 14, 1983, Ser. No. 504,218
Int. Cl.³ C07F 7/08, 7/18
U.S. Cl. 556—479 **9 Claims**

1. A method of hydrosilating non-aromatic carbon to carbon pi bonds comprising exposing a mixture of a compound having a said pi bond and a silane having silanic hydrogen to a platinum metal catalyst, and subjecting the mixture to ultrasonic energy while exposed to said catalyst.

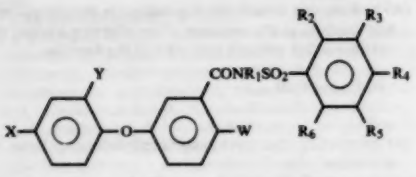
4,447,634

HERBICIDAL ARYLSULFONAMIDE DERIVATIVES OF PHENOXYBENZOIC ACIDS

Gunng-Huei Lee, East Windsor, N.J., assignor to Rhone-Poulenc Agrochimie, Lyons, France

Filed Apr. 30, 1981, Ser. No. 259,336
Int. Cl.³ A01N 41/06; C07C 143/78, 143/82
U.S. Cl. 560—13 **14 Claims**

1. A herbicidal compound of the formula



wherein W, X, Y, Z, R_1, R_2, R_3, R_4, R_5 and R_6 are as follows:

(1) W is selected from the group consisting of halo, NO_2, CN and H;

(2) X is selected from the group consisting of halo and halo-substituted C_1–C_4 alkyl;

(3) Y is selected from the group consisting of halo, CF_3, CN and NO_2;

(4) Z is selected from the group consisting of halo and H;

(5) R_1 is selected from the group consisting of H, C_1–C_6 alkyl, alkali metal salt, ammonium salt and quarternary ammonium salt; and

(6) R_2, R_3, R_4, R_5 and R_6 are the same or different and are selected from the group consisting of halo, alkyl, H, NO_2, CO_2R_7, CN, OR_8, CF_3 and substituted alkyl, wherein R_7 and R_8 are the same of different and are C_1–C_6 alkyl.

4,447,635

N-SUBSTITUTED IMIDO-DICARBOXYLIC ACID DIARYL ESTER COMPOUNDS AND HERBICIDE INTERMEDIATES

Karlfried Dickoré, Leverkusen, and Engelbert Kühle, Berg.-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

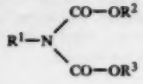
Continuation of Ser. No. 233,248, Feb. 10, 1981, abandoned. This application Jun. 30, 1982, Ser. No. 393,572

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1980, 3006226

Int. Cl.³ C07C *125/063*

U.S. Cl. 560—115 **13 Claims**

1. N-substituted imido-dicarboxylic acid diaryl ester compound of the formula



(I)

wherein

R^1 is a straight-chain or branched aliphatic radical which has 3 to 5 carbon atoms; a straight-chain or branched aliphatic radical which has 2 to 5 carbon atoms and substituted by lower alkoxy, lower alkylmercapto, halogen, cyano or nitro; or a cycloaliphatic radical which has 5 to 8 carbon atoms and is optionally substituted by lower alkyl; and

R^2 and R^3 independently represent a phenyl or naphthyl radical which is optionally substituted by chlorine, methyl and/or methoxy.

4,447,636

SYNTHESIS OF 11-DEOXYPROSTAGLANDINS

William L. White, Holliston, Mass., and Peter B. Anzeveno, Zionsville, Ind., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 10, 1982, Ser. No. 376,984

Int. Cl.³ C07C *69/74, 121/48*

U.S. Cl. 560—122 **1 Claim**

1. Trans-2-β,β,β-trichlorocarboethoxy-3-carbomethoxycyclopentanone.

4,447,637

EPIMERIZATION OF TRANS CHRYSANTHEMATES

Jacques Martel, Bondy; Jean Buendia, Le Perreux sur Marne, and Jeanine Nierat, Luzernes, all of France, assignors to Roussel Uclaf, Paris, France

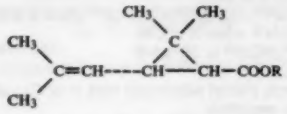
Filed Feb. 9, 1982, Ser. No. 347,278

Claims priority, application France, Feb. 13, 1981, 81 02828

Int. Cl.³ C07C *69/74, 61/18*

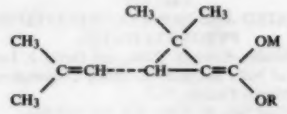
U.S. Cl. 560—124 **9 Claims**

1. A process for the epimerization of alkyl trans chrysanthemate comprising reacting at a low temperature in an anhydrous organic solvent an alkyl trans chrysanthemate of the formula



II

of the 1S,trans or 1R,trans configuration wherein R is alkyl of 1 to 6 carbon atoms with a strong alkali metal base to obtain a compound of the formula

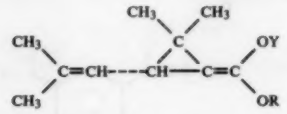


III

wherein R has the above definition and M is an alkali metal reacting the latter compound with a reactant of the formula

Y—A

wherein A is selected from the group consisting of chlorine, bromine, iodine and anion derived from a hydrogen acid and Y is an organic radical capable of forming a ketal of a ketene to obtain a compound of the formula



IV

reacting the latter at a low temperature in an anhydrous organic solvent with a proton donor to obtain a mixture of the corresponding alkyl cis chrysanthemate and alkyl trans chrysanthemate.

4,447,638

PREPARATION OF DIALKYL OXALATES BY THE OXIDATIVE CARBONYLATION OF ALCOHOLS WITH A HETEROGENEOUS PD-V-P-TI CONTAINING CATALYST SYSTEM

Anne M. Gaffney, and John A. Sofranko, both of West Chester, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 2, 1982, Ser. No. 404,203

Int. Cl.³ C07C *67/36*

U.S. Cl. 560—204 **13 Claims**

1. A process for the preparation of dialkyl oxalates by the oxidative carbonylation of a liquid saturated monohydric aliphatic or alicyclic alcohol containing from 1 to 20 carbon atoms with a mixture of carbon monoxide and oxygen or an oxygen-containing gas at a temperature of from about 40° C. to 150° C. and a total pressure of between about 500 psig and 6000 psig in the presence of a catalytic amount of an essentially insoluble tetra-metallic-containing heterogeneous catalyst

comprising palladium or a salt thereof in combination with a crystalline vanadium oxide-phosphorus oxide-titanium oxide containing compound said catalyst containing as the metals an atomic ratios of palladium to vanadium to phosphorus to titanium of from about 0.003:1:0.5:0.1 to about 0.32:1:5:5 and recovering the desired dialkyl oxalate.

4,447,639

OXIDATIVE CARBONYLATION OF ALCOHOLS TO DIALKYL OXALATES USING A HETEROGENEOUS IRON PROMOTED PD-V-P CATALYST

John A. Sofranko, and Anne M. Gaffney, both of West Chester, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 6, 1982, Ser. No. 405,972
Int. Cl.³ C07C *67/36*
U.S. Cl. 560—204 **13 Claims**

1. A process for the preparation of dialkyl oxalates by the oxidative carbonylation of a liquid saturated monohydric aliphatic or alicyclic alcohol containing from 1 to 20 carbon atoms with a mixture of carbon monoxide and oxygen or an oxygen-containing gas at a temperature of from about 40° C. to 150° C. and a total pressure of between about 500 psig and 6000 psig in the presence of a catalytic amount of an essentially insoluble tetra-metallic-containing heterogeneous catalyst comprising palladium or a salt thereof in combination with a crystalline vanadium oxide-phosphorus oxide-iron oxide containing compound said catalyst containing as the metals an atomic ratio of palladium to vanadium to phosphorus to iron of from about 0.003:1:0.5:0.1 to about 0.32:1:5:5 and recovering the desired dialkyl oxalate.

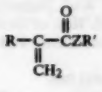
4,447,640

PREPARATION OF α-UNSATURATED CARBOXYLIC ESTERS AND AMIDES FROM 1,2-DIHALOALKANES BY CARBONYLATION

Kathryn A. Eickholt, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 17, 1982, Ser. No. 378,672
Int. Cl.³ C07C *67/36, 102/00*
U.S. Cl. 560—207 **21 Claims**

1. A process for preparing α-unsaturated carboxylic esters or amides represented by the formula



wherein:

R is hydrogen, alkyl or aryl;

R′ is hydrogen, alkyl, cycloalkyl or benzyl which may be substituted with amine groups, hydroxyl groups or carboxylic acid groups; and

Z is O or NR′;

comprising contacting a 1,2-dihaloalkane represented by the formula

wherein R is as defined above and X is separately in each occurrence chlorine, bromine or iodine; with an alcohol or amine represented by the formula

R′ZH

wherein R′ and Z are as defined above; and with carbon monoxide in the presence of a catalytic amount of a group VIII metal at elevated temperature and pressure.

4,447,641

PROCESS FOR PREPARATION OF ALPHA, BETA-UNSATURATED ESTERS USING AMS-1B BOROSILICATE CRYSTALLINE MOLECULAR SIEVE

Gary P. Hagen, Glen Ellyn, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 26, 1982, Ser. No. 401,549
Int. Cl.³ C07C *67/343*
U.S. Cl. 560—211 **21 Claims**

1. A process for the preparation of alpha, beta-unsaturated methyl esters by reaction between dimethylformal and carboxylic acid compounds of the formula RCH_2COOR' wherein R is a member of the class consisting of —H, -alkyl, -aryl, -aralkyl, -cycloalkyl, and -alkylaryl radicals and R′ is selected from the group consisting of —H radicals and $-CH_3$ *radicals, in the presence of AMS-*1B borosilicate crystalline molecular sieve catalyst under reaction conditions wherein the acid compound-:dimethylformal mole ratio is from about 0.5:1 to 20:1 at a temperature within the range of from about 250° C. to about 430° C.

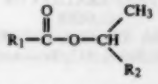
4,447,642

PREPARATION OF ALKYL CARBOXYLATES

Lewis B. Young, Skillman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 217,979, Dec. 19, 1980, Pat. No. 4,365,083. This application Sep. 30, 1982, Ser. No. 429,937
The portion of the term of this patent subsequent to Dec. 21, 1999, has been disclaimed.
Int. Cl.³ C07C *67/04*
U.S. Cl. 560—247 **6 Claims**

1. A process for the preparation of alkyl carboxylate mixtures enriched in alpha-methylalkyl carboxylates of the formula:



wherein R_1 is alkyl of 1 to 10 carbon atoms and R_2 is C_4–C_{18} alkyl, said process comprising:

reacting an olefin mixture containing at least 25 percent of a C_6 to C_{20} olefin having no unsaturation at the site of the No. 2 carbon atom thereof, with a C_1 to C_{10} carboxylic acid, said reaction being carried out under ester-forming reaction conditions including the presence of a catalyst comprising the crystalline zeolite material mordenite, to thereby selectively produce an alkyl carboxylate ester product which is enriched in the alpha-methylalkyl carboxylate ester.

4,447,643

PROCESS FOR RECOVERING OXYGENATED ORGANIC COMPOUNDS FROM DILUTE AQUEOUS SOLUTIONS EMPLOYING LIQUID EXTRACTION MEDIA

Julian Feldman, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

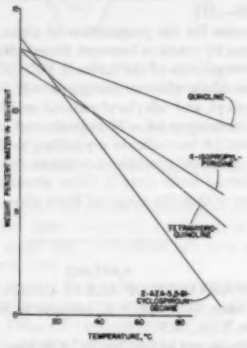
Continuation-in-part of Ser. No. 305,884, Sep. 28, 1981, Pat. No. 4,346,241. This application Aug. 11, 1982, Ser. No. 407,224
The portion of the term of this patent subsequent to Oct. 11, 2000, has been disclaimed.
Int. Cl.³ C07C *67/48, 51/42, 41/34, 29/74*
U.S. Cl. 560—248 **5 Claims**

1. A process for obtaining substantially anhydrous oxygenated organic material from a dilute aqueous solution thereof which comprises

(a) contacting the dilute aqueous oxygenated organic material solution with an inert organic extractant which is liquid at ambient pressure and temperature in at least one extraction zone for a period of time sufficient to provide a raffinate phase containing significantly less oxygenated

organic material than the dilute aqueous feed, and an extract phase containing a significant amount of the oxygenated organic material originally present in the dilute aqueous feed,

(b) concentrating the extract phase resulting from step (a) in a rectifying column to provide an aqueous oxygenated organic material of high concentration; and,



(c) azeotropically distilling the concentrated solution resulting from step (b) in the anhydrous column operated under substantially superatomospheric pressure with thermal values recovered from the anhydrous column overheads being used to satisfy part or all of the thermal operating requirements of the rectifying column.

4,447,644

METHOD FOR PREPARATION OF ARYLPYRUVIC ACID

Moustafa El-Chahawi, Troisdorf, Fed. Rep. of Germany, assignor to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 223,065, Jan. 7, 1981, abandoned, which is a continuation of Ser. No. 50,028, Jun. 19, 1979, abandoned. This application May 24, 1982, Ser. No. 381,133

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1978, 28280413

Int. Cl.³ C07C *51/10*

U.S. Cl. 562—406 **6 Claims**

1. A process for the preparation of an optionally substituted pyruvic acid comprising contacting an optionally substituted arylmethylhalide with carbon monoxide in the presence of a metal carbonyl, an alkali metal hydroxide and a mixture of a branched chain alcohol and water at $-10°$ to $+70°$ C. while employing at least two mols of carbon monoxide per mol of arylmethylhalide, said branched chain alcohol being selected from the group consisting of tertiary butanol, tertiary amyl alcohol and isopropanol, the reaction mixture consisting essentially of said optionally substituted arylmethylhalide, carbon monoxide, metal carbonyl, alkali metal hydroxide, water and said branched chain alcohol and thereafter acidifying the resultant salt with an acid.

4,447,645

PROCESS FOR PURIFICATION OF P-HYDROXYMETHYLBENZOIC ACID

John A. Donohue, Elmhurst; James O. Knobloch, Naperville; Bruce Petty-Weeks, Naperville, and Steven A. Cerefice, Naperville, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 30, 1982, Ser. No. 445,659

Int. Cl.³ C07C *69/76*

U.S. Cl. 562—473 **9 Claims**

1. A process for purification of p-hydroxymethylbenzoic acid containing 4-carboxybenzaldehyde, p-toluic acid, and terephthalic acid impurities wherein said p-hydroxymethylbenzoic acid is prepared as an ammonium salt by electrochemical reduction of terephthalic acid which purification process comprises:

(a) hydrogenation of said ammonium salt in the presence of a suitable catalyst to convert said 4-carboxybenzaldehyde impurities to p-hydroxymethylbenzoic acid,

(b) springing said p-hydroxymethylbenzoic acid from said ammonium salt,

(c) filtration to remove said terephthalic acid impurities by hot aqueous filtration of said p-hydroxymethylbenzoic acid,

(d) hydrocarbon extraction of said p-toluic acid impurities from p-hydroxymethylbenzoic acid by a suitable hydrocarbon solvent, and

(e) crystallization of substantially pure p-hydroxymethylbenzoic acid from aqueous solution.

4,447,646

PROCESS FOR THE PURIFICATION OF TEREPHTHALIC ACID

Griffin I. Johnson, and Judy E. Kiefer, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 28, 1983, Ser. No. 461,705

Int. Cl.³ C07C *51/42*

U.S. Cl. 562—487 **17 Claims**

1. In a process for the purification of crude terephthalic acid produced by oxidation of para-xylene, said purification process comprising contacting said crude terephthalic acid with oxygen-containing gas at elevated temperature and pressure in the presence of a solvent comprising at least one lower alkanoic acid and a catalyst system comprising cobalt and a bromide compound, the improvement comprising employing samarium in said catalyst system in a concentration of about 0.005 to 500 ppm.

4,447,647

PROCESS FOR THE PREPARATION OF 2,4,6-TRICHLOROANILINE

Friedrich Werner, Belford Roxo, Brazil; Karl Mannes, and Viktor Trescher, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

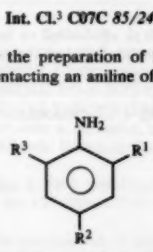
Filed Dec. 28, 1982, Ser. No. 453,984

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1982, 3200069

Int. Cl.³ C07C *85/24*

U.S. Cl. 564—412 **12 Claims**

1. A process for the preparation of 2,4,6-trichloroaniline which comprises contacting an aniline of the formula



wherein

R^1, R^2 and R^3 independently represent hydrogen or halogen and at least one of the radicals denotes hydrogen,

and/or their hydrochlorides, with a chlorinating agent in the presence of an inert organic solvent or diluent at a temperature above 80° C.

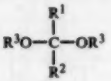
4,447,648

PROCESS FOR MAKING ALDEHYDES FROM KETALS

Richard W. Wegman, Cross Lanes, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 31, 1982, Ser. No. 413,466
Int. Cl.³ C07C 45/49
U.S. Cl. 568—484 21 Claims

1. Method of preparing saturated aliphatic aldehydes which comprises contacting a gem diether having the formula:



wherein

each of R^1 and R^2 is a monovalent radical selected from the class consisting of alkyl, aryl radicals having 6 to about 10 carbon and cycloalkyl radicals having 5 to about 7 carbons;

R^3 is a monovalent radical selected from the group consisting of alkyls having 1 to about 10 carbons and aryl having 6 to about 10 carbons with a catalytic amount of a Group VIII compound at a temperature of about 80° to 175° C. and a pressure of about 500 to about 6000 psig in the presence of a mixture of carbon monoxide and hydrogen.

4,447,649

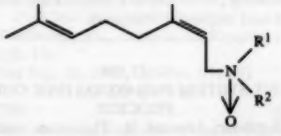
PROCESS FOR THE MANUFACTURE OF CITRAL

Manfred W. Breuninger, Freiburg, Fed. Rep. of Germany, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 304,723, Sep. 23, 1981. This application Sep. 27, 1982, Ser. No. 423,761
Claims priority, application Switzerland, Oct. 31, 1980, 8124/80
Int. Cl.³ C07C 45/00, 47/21
U.S. Cl. 568—484 4 Claims

1. A process for the manufacture of a citral compound of the formula

which process comprises reacting at a temperature of from 0° C. to 100° C. a compound of the formula



wherein R^1 and R^2 are the same or different C_{2-6}-alkyl substituent or R^1 and R^2 together with the N-atom is a C_{4-6}-cyclic group, with an anhydride of a C_{2-6}-alkanecarboxylic acid.

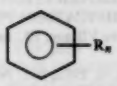
4,447,650

METHYLENE COUPLING OF AROMATICS

James M. Renga, Midland, Mich., assignor to The Dow Chemical Company, Midland, Ohio

Filed Jul. 26, 1982, Ser. No. 401,768
Int. Cl.³ C07C 41/18, 37/11, 17/00
U.S. Cl. 568—640 9 Claims

1. A process for preparing methylene coupled aromatic compounds comprising contacting an aromatic compound of the formula:



where R is independently each occurrence hydrogen, halogen, nitro, hydroxyl, or an alkyl, alkoxy, aryl, aralkyl, haloalkyl, alkoxycarbonyl or aroxy group of up to about 12 carbons; and n is an integer from one to four, with chloromethyl methyl carbonate at a temperature from about 25° C. to about 250° C., in the presence of a catalytic amount of a Lewis acid.

4,447,651

1,4-BIS-(4-CHLORO-2-METHOXYSTYRYL)-BENZENE

Carl-Wolfgang Schellhammer, Bergisch Gladbach, and Bernhard Wehling, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 22, 1982, Ser. No. 370,697
Claims priority, application Fed. Rep. of Germany, May 9, 1981, 3118525
Int. Cl.³ C07C 43/263
U.S. Cl. 568—645 1 Claim

1. 1,4-Bis-(4-chloro-2-methoxystyryl)-benzene.

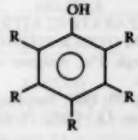
4,447,652

PREPARATION OF ALKYL ARYL ETHERS

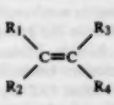
Paul R. Kurek, Schaumburg, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed May 21, 1982, Ser. No. 380,808
Int. Cl.³ C07C 41/06
U.S. Cl. 568—658 5 Claims

1. A method of preparing an alkyl aryl ether comprising contacting a feedstock consisting essentially of a phenol of the formula,



where each R is hydrogen or an alkyl group, and from about 1.5 to about 6 molar proportions of an olefin containing from 3 to about 16 carbon atoms of the formula,



where each R is hydrogen or an alkyl group and from one to three such R groups are alkyl, with an unmodified macroreticular cationic exchange resin bearing sulfonic acid groups of which from about 10 to about 90 percent are in the form of their salt with an alkali metal cation at a temperature from about 80° C. to about 120° C., and recovering the alkyl aryl ether produced thereby.

4,447,653

ADSORBENT REGENERATION IN INTEGRATED ETHERIFICATION PROCESS

Bipin V. Vora, Elk Grove Village, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jul. 6, 1982, Ser. No. 395,413
Int. Cl.³ C07C 41/06, 41/00
U.S. Cl. 568—697 5 Claims

1. A process for the production of an ether which comprises the steps of:

(a) passing a first process stream comprising an isoparaffin through a catalytic dehydrogenation reaction zone and thereby producing a reaction zone effluent stream comprising the isoparaffin and a corresponding isoolefin;

(b) passing the reaction zone effluent stream and a hereinafter characterized second process stream into a stripping column and producing a stripping column bottoms stream comprising the isoparaffin, oxygen-containing hydrocarbonaceous compounds and the corresponding isoolefin;

(c) passing the stripping column bottoms stream and a feed stream comprising an alcohol into an etherification zone maintained at etherification conditions, and withdrawing from the etherification zone a product stream comprising the ether and a hydrocarbon recycle stream comprising the isoparaffin and oxygen-containing hydrocarbonaceous compounds;

(d) removing oxygen-containing hydrocarbonaceous compounds from the hydrocarbon recycle stream by contacting the hydrocarbon recycle stream with a selective sorbent at sorption-promoting conditions in a sorption zone to produce an isoparaffin-rich recycle stream;

(e) processing a first portion of said isoparaffin-rich recycle stream to produce additional amounts of the isoolefin;

(f) heating a second portion of said isoparaffin-rich recycle stream to a temperature of above 250° F.; and

(g) regenerating sorbent in the sorption zone by a regeneration procedure which comprises contacting sorbent present in the sorption zone with a regeneration stream comprising said heated isoparaffin-rich recycle stream of step (f) at regeneration-promoting conditions to produce said previously referred to second process stream, which comprises the isoparaffin and oxygen-containing hydrocarbonaceous compounds.

4,447,654

PROCESS FOR SEPARATING NITRATED PHENOLIC COMPOUNDS FROM OTHER PHENOLIC COMPOUNDS

Gerd Leston, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Sep. 30, 1982, Ser. No. 431,640
Int. Cl.³ C07C 79/22
U.S. Cl. 568—708 24 Claims

1. A process for resolving a mixture of two or more phenolics at least one of which is a nitrated phenolic, comprising the step of

treating a mixture of two or more closely-boiling phenolics at least one of which is a nitrated phenolic with a metal halide salt selected from the group consisting of calcium bromide, calcium chloride, lithium bromide, magnesium chloride and magnesium bromide, at a temperature of from about 0° C. to about 150° C., so as to form preferentially a complex comprised of the selected metal halide salt and one of the phenolics,

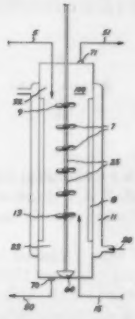
whereby the preferentially-formed metal halide salt-phenolic complex may be isolated and thereafter decomposed to a product comprising a predominantly greater amount of one phenolic over other phenolics present, as compared to the relative amounts of phenolics present in the original mixture of phenolics.

4,447,655

PURIFICATION OF BISPHENOL-A

Ashok K. Mendiratta, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 24, 1982, Ser. No. 444,103
Int. Cl.³ C07C 2/58
U.S. Cl. 568—724 7 Claims



1. A process for simultaneously and continuously purifying the bisphenol-A crystals and the aqueous liquid of a water/-BPA crystals slurry, said process comprising the steps of:

(a) forming an aqueous-crystal stream from a water/BPA crystals slurry, said aqueous-crystal stream having a flow which is substantially downward and continuous;

(b) contacting said aqueous-crystal stream with a stream comprising an organic solvent in a region of intersecting paths, the stream of organic solvent having a flow in a direction substantially upward and counter-current to the flow of said aqueous crystal stream, said organic solvent being immiscible in water, lighter than water and a good solvent medium for impurities within said aqueous liquid and bisphenol-A crystals;

(c) mixing the aqueous-crystal stream and the organic solvent stream passing through the region of contact in the center of said region of contact;

(d) forming a lower aqueous-crystal phase below the the region of contact and an upper organic solvent phase above the region of contact;

(e) recovering purified bisphenol-A crystals and purified aqueous liquid from said lower aqueous-crystal phase;

(f) removing organic solvent with extracted impurities from said upper organic solvent phase;

said process being performed at a temperature below the melting point of said bisphenol-A crystals.

4,447,656

SOLVENT SYSTEM FOR OXIDATIVE COUPLING PROCESS

Larry D. Kershner; Leonard R. Thompson, and Robert M. Strom, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 241,970, Mar. 9, 1981, abandoned. This application Feb. 24, 1983, Ser. No. 469,194
Int. Cl.³ C07C 39/15
U.S. Cl. 568—730 32 Claims

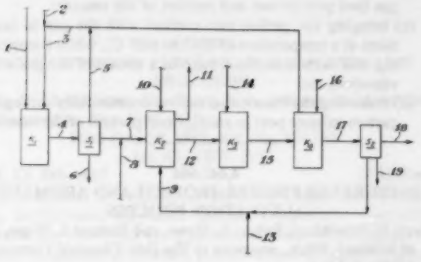
1. A process for preparation of 2,2',6,6'-tetratertiarybutyl-p,p'-biphenol comprising

(1) contacting 2,6-ditertiarybutylphenol with an oxygen-containing gas at an elevated temperature and pressure in a liquid reaction medium in the presence of a heterogeneous dehydrogenation catalyst capable of producing carbon-carbon coupling products of the 2,6-ditertiarybutylphenol until substantial amounts of 3,3',5,5'-tetratertiarybutyl-4,4'diphenoquinone are formed;

(2) reducing the 3,3',5,5'-tetratertiarybutyl-4,4'diphenoqui-

none by contacting the liquid reaction medium containing 3,3',5,5'-tetratertiarybutyl-4,4'-diphenoquinone under reducing conditions with hydrogen in the presence of a heterogeneous hydrogenation catalyst or with 2,6-ditertiarybutylphenol until substantial amounts of 2,2',6,6'-tetratertiarybutyl-p,p'-biphenol are formed; and

(3) separating the liquid reaction medium containing



2,2',6,6'-tetratertiarybutyl-p,p'-biphenol from the reaction mixture, provided that the liquid reaction medium is characterized in that under the reaction conditions of steps (1) and (2), 2,6-ditertiarybutylphenol and 3,3',5,5'-tetratertiarybutyl-4,4'-diphenoquinone are substantially soluble; and that under the reaction conditions of steps (2) and (3) 2,2',6,6'-tetratertiarybutyl-p,p'-biphenol is substantially soluble.

4,447,657

PREPARATION OF ORTHO-ALKYLATED PHENOLS

Bruce E. Firth, Arlington Heights, Ill., and Terry J. Rosen, Berkeley, Calif., assignors to UOP Inc., Des Plaines, Ill.

Filed Nov. 10, 1982, Ser. No. 440,676

Int. Cl.³ C07C *37/05, 39/06*

U.S. Cl. 568—783 **13 Claims**

1. A method of rearranging a secondary alkyl or tertiary alkyl phenyl ether to an ortho-alkylphenol comprising contacting said ether with an alumina selected from the group consisting of halided aluminas, aluminas containing an alkali metal cation in the matrix, and silica-alumina containing up to about 75% silica, at a temperature from about 75° C. to about 175° C. and recovering the ortho-alkyl phenol.

4,447,658

PROCESS FOR SEPARATING 3,5-XYLENOL OR 3,4-XYLENOL FROM OTHER POLYMETHYLATED PHENOLIC COMPOUNDS

Gerd Leston, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Sep. 30, 1982, Ser. No. 431,651

Int. Cl.³ C07C *37/68*

U.S. Cl. 568—750 **12 Claims**

1. A process for resolving a mixture of two or more polymethylated phenolics at least one of which is selected from the group consisting of 3,5-xylenol and 3,4-xylenol, comprising the step of

treating a mixture of two or more closely-boiling polymethylated phenolics at least one of which is selected from the group consisting of 3,5-xylenol and 3,4-xylenol with a metal halide salt selected from the group consisting of calcium bromide, calcium chloride lithium bromide, magnesium chloride and magnesium bromide, at a temperature of from about 0° C. to about 150° C., so as to form preferentially a complex comprised of the selected metal halide salt and one of the phenolics,

whereby the preferentially-formed metal halide salt-phenolic complex may be isolated and thereafter decomposed to a product comprising a predominantly greater amount of one phenolic over other phenolics present, as compared to the relative amounts of phenolics present in the original mixture of phenolics.

4,447,659

DECOMPOSITION OF POLYCARBONATES TO FORM TERMINALLY UNSATURATED ALCOHOLS

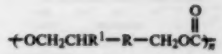
Charles W. Blewett, Fort Mitchell, Ky., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Sep. 27, 1982, Ser. No. 423,897

Int. Cl.³ C07C *29/60, 33/025*

U.S. Cl. 568—876 **13 Claims**

1. A process for the preparation of terminally unsaturated alcohols, said process comprising thermally decomposing a polycarbonate represented by the formula:



wherein R is a bivalent alkylene radical having from 3 to about 19 carbon atoms, R^1 is hydrogen or an alkyl group and n is an integer from about 2 to about 500 in the presence of a titanium containing catalyst selected from the group consisting of titanates, condensates of said titanates, titanium chelates and titanium acylates.

4,447,660

PROCESS FOR THE ISOMERIZATION OF ORTHO-AND PARA-BROMOPHENOLS OR THE ETHERS THEREOF INTO META-BROMOPHENOLS AND CORRESPONDING ETHERS

Marie-Paule Jouannetaud; Jean-Pierre Gesson, and Jean-Claude Jacquesy, all of Poitiers, France, assignors to PCUK Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Continuation of Ser. No. 267,415, May 26, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 428,677

Claims priority, application France, Jun. 3, 1980, 80 12262

Int. Cl.³ C07C *39/27*

U.S. Cl. 568—774 **6 Claims**

1. A process for the isomerization of ortho- and para-bromo phenols or the ethers thereof into corresponding meta-brominated derivatives, comprising isomerizing the ortho- or para-brominated phenols or ethers in the presence of a liquid superacidic medium having a H_0 acidity estimated on the Hammett logarithmic scale of greater than −11 up to about 31 25 at elevated temperatures to effect isomerization of the ortho- and para-bromophenols or the corresponding ethers to the meta-brominated derivatives.

4,447,661

PROCESS FOR PRODUCING AN ALCOHOL BY HYDROFORMYLATION

Satoshi Hoshiyama; Hiroyuki Muto; Shuzo Shinke; Kanji Otsuka; Shinichiro Takigawa, and Hiroyuki Yamazaki, all of Funabashi, Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Filed Sep. 7, 1982, Ser. No. 415,236

Claims priority, application Japan, Sep. 7, 1981, 56-140664

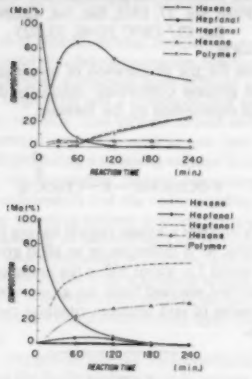
Int. Cl.³ C07C *45/50*

U.S. Cl. 568—882 **11 Claims**

1. In a process for producing an alcohol by hydroformylation which comprises reacting straight chained, branched, or alicyclic mono-olefin having from 3 to 20 carbon atoms with carbon monoxide and hydrogen to form an alcohol having carbon atoms greater in number by one than the carbon atoms of the mono-olefin, the improvement which comprises:

(a) a first step in which the mono-olefin is hydroformylated with use of a cobalt carbonyl catalyst selected from the group consisting of $HCo(CO)_4$ and $Co_2(CO)_8$ catalysts in the presence of a gas mixture of carbon monoxide and

hydrogen in a volume ratio of the hydrogen to the carbon monoxide of from 0.8 to 2.0 at a temperature of from 80° to 180° C. under pressure of from 150 to 250 kg/cm^2 to selectively form an aldehyde at a conversion of the mono-olefin being from 50 to 95 mol % while suppressing the formation of an alcohol, and the cobalt carbonyl catalyst is then removed from the unreacted olefin and the formed aldehyde by decomposition or extraction, and



(b) a second step in which the mixture of the unreacted mono-olefin and the formed aldehyde freed from the cobalt carbonyl catalyst in the first step is reacted with a gas mixture of carbon monoxide and hydrogen in a volume ratio of the hydrogen to the carbon monoxide of from 1.1 to 10 with use of a cobalt trialkylphosphine complex catalyst at a temperature of from 160° to 250° under pressure of from 30 to 200 kg/cm^2 thereby simultaneously hydroformylating the unreacted mono-olefin and hydrogenating the aldehyde to form the alcohol.

4,447,662

BETA-DICARBONYL COMPOUNDS FOR THE PROMOTION OF AROMATIC NITRATION BY NITROGEN TETROXIDE

David S. Ross, Palo Alto; Robert M. Johnson, Jr., San Mateo, and Ripudaman Malhotra, Menlo Park, all of Calif., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 10, 1982, Ser. No. 386,856
Int. Cl.^{3} C07C *79/10*
U.S. Cl. 568—939 26 Claims

1. In a process for the nitration of an aromatic hydrocarbon, the method which comprises nitrating the aromatic hydrocarbon in a liquid reaction medium consisting essentially of nitrogen tetroxide, optionally an inert organic solvent and an effective amount of a beta-dicarbonyl compound which can assume a "W" configuration with a carbonyl group at each apex of the "W", at a temperature sufficient to effect nitration.

4,447,663

PROCESS FOR CONTINUOUS FLUORINATION OF CARBON

Toru Akiyama; Tsutomu Kamihigoshi, both of Takatsuki; Shoji Takagi, Toyonaka, and Tadayuki Maeda, Settsu, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Division of Ser. No. 132,992, Mar. 24, 1980, Pat. No. 4,348,363.
This application Mar. 1, 1982, Ser. No. 353,221
Claims priority, application Japan, Mar. 30, 1979, 54-39193; May 31, 1979, 54-74256
Int. Cl.^{3} C07C *17/00*
U.S. Cl. 570—150 5 Claims

1. A process for the continuous fluorination of carbon in a horizontal reactor, said reactor having a trough provided with a plurality of weirs, carbon feed and exhaust ports in both end portions of the reactor, fluorine gas feed and exhaust ports in both end portions of the reactor, which comprises the steps of:

(a) introducing continuously a carbon onto the trough through a carbon feed port in one end portion of the reactor,

(b) introducing a fluorine gas or a mixture of fluorine gas and diluent continuously into the reactor through a fluorine gas feed port in one end portion of the reactor,

(c) bringing the carbon into contact with the gas to react them at a temperature of 200° to 600° C., while transporting said carbon on the trough in a stream of the gas with vibration, and

(d) removing the fluorinated carbon continuously through a carbon exhaust port in another end portion of the reactor.

4,447,664

INTEGRATED FISCHER-TROPSCH AND AROMATIC ALKYLATION PROCESS

Craig B. Murchison; Robert A. Stowe, and Richard L. Weiss, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 23, 1982, Ser. No. 422,317
Int. Cl.^{3} C07C *2/68*
U.S. Cl. 585—323 20 Claims

1. A process for alkylating an aromatic hydrocarbon comprising:

(1) contacting a mixture of hydrogen and carbon monoxide with a Fischer-Tropsch catalyst at conditions effective to form a first gas mixture containing an alkylating agent selected from ethylene or mixtures of ethylene and propylene;

(2) removing from the first gas mixture components capable of alkylating aromatics and having boiling points higher than the selected alkylating agent to form a second gas mixture which contains less than about 10 mole percent of the selected alkylating agent and more than about 5 mole percent each of carbon monoxide and hydrogen;

(3) combining the second gas mixture with sufficient alkylatable aromatic hydrocarbon to form a third mixture containing at least about a 1 to 1 aromatic to alkylating agent mole ratio; and

(4) contacting the third mixture with a heterogeneous alkylation catalyst at conditions effective to alkylate the aromatic hydrocarbon.

4,447,665

DEHYDROGENATION REACTIONS

Arnold N. Wennerberg, Chicago, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 30, 1983, Ser. No. 480,407
Int. Cl.^{3} C07C *5/32;* B01J *21/18*
U.S. Cl. 585—379 24 Claims

1. A method for dehydrogenating a paraffinic or naphthenic compound, comprising: contacting an aforesaid compound under dehydrogenation conditions comprising a temperature in the range of from about 465° C. to about 650° C. with an active carbon catalyst having a cage-like structure and a BET surface area of at least 800 square meters per gram and a bulk density of at least 0.1 gram per cubic centimeter and comprising a substantially uniform dispersion of a metal, metal-containing material, or both in a porous carbon matrix, wherein the dispersed metal and metal in the dispersed metal-containing material are each a transition metal, wherein the total concentration of dispersed metal and dispersed metal-containing material is from about 0.001 to about 30 weight percent, calculated as the elemental metal and based on the weight of the catalyst, and wherein the catalyst is formed by a process comprising pyrolyzing a uniform powdered mixture of a precursor of the metal or metal-containing material, a carbon precursor and inorganic solids comprising an alkali metal hydroxide, in

an inert atmosphere and at a temperature in the range of from about 400° C. to about 980° C.

4,447,666

PARA-SELECTIVE ALKYLATION CATALYSTS AND PROCESSES

John P. McWilliams, Woodbury, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,763
Int. Cl.³ C07C *3/52*
U.S. Cl. 585—467 **16 Claims**

1. A method for making an improved magnesium-containing, zeolite-based alkylation catalyst composition especially suitable for promoting the alkylation of mono-substituted aromatic compounds to produce a disubstituted aromatic product enriched in the 1,4-isomer of the resulting disubstituted aromatic compound, said method comprising:

(a) preparing a base catalyst composite comprising from about 25% to 80% by weight of a siliceous crystalline zeolite material characterized by a silica to alumina mole ratio of at least about 12, a Constraint Index within the approximate range of from about 1 to 12, a zeolite crystal major dimension of from about 1 to 10 microns, and a zeolite crystal minor dimension of from about 0.2 to 4 microns; said composite further comprising from about 20% to 75% by weight of an inorganic oxide binder;

(b) contacting said base catalyst composite with an aqueous solution of magnesium nitrate under contacting conditions, and for a period of time sufficient to incorporate magnesium nitrate onto said base catalyst composite; said contact of catalyst composite with said magnesium nitrate solution occurring without either prior or subsequent contact of said composite with solutions of phosphorus compounds; and

(c) calcining said magnesium nitrate-treated catalyst composite in a nitrogen-containing or oxygen-containing atmosphere at a temperature of from about 200° C. to 565° C. for a period of time sufficient to form an aromatics alkylation catalyst composition which contains from about 4% to 8% by weight of magnesium present at least in part as magnesium oxide, said alkylation catalyst composition being substantially free of phosphorus.

4,447,667

PROCESS FOR THE DEHALOGENATION OF ORGANIC COMPOUNDS

Dane K. Parker, Massillon, and Timothy A. Sabo, Southington, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 22, 1982, Ser. No. 421,678
Int. Cl.³ C07C *1/20*; C10G *21/16*
U.S. Cl. 585—469 **4 Claims**

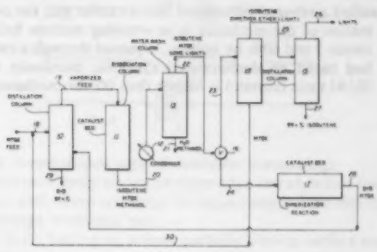
1. A process for the dehalogenation of halogenated organic materials wherein the dehalogenation is accomplished through reaction with an alkali metal aromatic radical anion reagent, the improvement comprises quenching the excess reagent after dehalogenation is completed by contacting the reaction mixture with carbon dioxide.

4,447,668

PROCESS FOR PRODUCING HIGH PURITY ISOOLEFINS AND DIMERS THEREOF BY DISSOCIATION OF ETHERS

Lawrence A. Smith, Jr., Bellaire; Edward M. Jones, Jr., Friendswood, and Dennis Hearn, Houston, all of Tex., assignors to Chemical Research & Licensing Company, Houston, Tex.

Continuation of Ser. No. 363,053, Mar. 29, 1982, abandoned. This application May 25, 1983, Ser. No. 496,983
Int. Cl.³ C07C *1/00*
U.S. Cl. 585—639 **34 Claims**



1. A process for producing high purity isobutene comprising:

(a) feeding an alkyl tertiary butyl ether to a distillation column reactor into a feed zone at the lower end of a fixed bed acid cation resin packing, said alkyl having three to six carbon atoms,

(b) concurrently in said distillation column reactor:

(1) contacting said ether with said fixed bed cation exchange resin packing thereby catalytically dissociating said ether into an isobutene and alcohol having three to six carbon atoms and corresponding to said alkyl, thereby forming a non azeotroping mixture of isobutene and said alcohol, and

(2) fractionating the resulting mixture in said fixed bed cation exchange resin packing,

(c) withdrawing isobutene free of alcohol from said distillation column reactor at a point above said packing,

(d) withdrawing said alcohol from the distillation column reactor at a point below said packing.

5. A process for producing high purity diisoolefin comprising:

(a) vaporizing a feed stream containing alkyl tertiary C_4 or C_5 ether,

(b) passing said feed stream in a vaporized state through a first fixed bed cation acidic exchange resin whereby the alkyl tertiary C_4 or C_5 ether is at least partially dissociated to produce a product stream from said bed, containing isobutene or isoamylene, and an alcohol corresponding to the alkyl radical and unreacted alkyl tertiary C_4 or C_5 ether,

(c) removing said alcohol from said product stream,

(d) passing said alcohol depleted product stream in liquid phase into contact with a second fixed bed cation acidic exchange resin to form a diisoolefin product stream, and

(e) separating diisoolefin from said diisoolefin product stream.

4,447,669

PRODUCTION OF HYDROCARBONS FROM METHANOL IN THE PRESENCE OF ZEOLITE CATALYSTS

Christian Hamon, Saint Nazaire; Jean Bandiera, Lyons, and Michel Senes, La Baule, all of France, assignors to Societe Chimique de la Grande Paroisse, Azote et Produits Chimiques, Paris, France

Filed Dec. 17, 1982, Ser. No. 450,910

Claims priority, application France, Jan. 4, 1982, 82 00011

Int. Cl.³ C07C *1/20, 1/00*

U.S. Cl. 585—640 **15 Claims**

1. Method of producing light olefinic hydrocarbons having 2–5 carbons from methanol, in particular unsaturated hydrocarbons, in the presence of a zeolitic mordenite catalyst, wherein

gasified methanol introduced into a carrier gas, the concentration of the methanol in an entering mixture being between 5 and 60% by volume, is passed through a catalytic bed based on dealuminised synthetic mordenite whose Si/Al ratio (atomic) is higher than 80, the methanol flow rate being between 1 and 5 liters of liquid methanol per liter of catalyst and per hour, the reaction being carried out at a temperature between 350° and 550° C., under a pressure which can reach 20 bars;

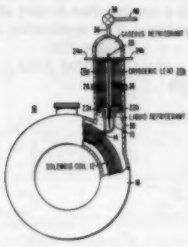
said synthetic mordenite having been de-aluminised by subjecting the mordenite to a series of alternate acid and hydrothermic treatments; during the acid treatment phase, subjecting the mordenite to treatment in a concentrated acid medium, at a temperature between 60° and 90° C., with stirring for some hours; in the hydrothermic treatment phase, bringing the mordenite to a temperature between 550° and 680° C. for some hours, at atmospheric pressure, in an air-steam mixture of which the air-steam flow rate under normal conditions of temperature and pressure is between 500 and 1250 l/h for a weight of catalyst of 1 kg, the steam concentration by volume being between 2.5 and 60%; the series of treatments commencing with an acid treatment and terminating with an acid treatment.

4,447,670

HIGH-CURRENT CRYOGENIC LEADS

Phillip W. Eckels, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 9, 1982, Ser. No. 367,144
Int. Cl.³ H01F 5/08
U.S. Cl. 174—15 CA 11 Claims



1. An electrical lead, comprising:

a plurality of tubes, each of said plurality of tubes being a laminar assembly of an inner electrically conductive sleeve and an outer sleeve, said plurality of tubes being arranged in a parallel association;

an upper electrically conductive block connected to a first end of each of said plurality of tubes, said upper electrically conductive block having a plurality of holes therethrough, each of said plurality of holes being aligned in fluid communication with a preselected one of said plurality of tubes, said upper electrically conductive block being in electrical communication with said first end of each of said plurality of tubes;

a lower electrically conductive block connected to a second end of each of said plurality of tubes, said lower electrically conductive block having a plurality of holes therethrough, each of said plurality of holes of said lower electrically conductive block being aligned in fluid communication with a preselected one of said plurality of tubes, said lower electrically conductive block being in electrical communication with said second end of each of said plurality of tubes; and

means for restricting fluid flow through the central bore of said inner electrically conductive sleeve, said restricting means having an orifice therein.

3. A tubular conductor, comprising:

a first tube, said first tube being electrically conductive;

a second tube disposed around said first tube in coaxial and concentric relation;

a first fluid flow restrictor disposed inside the central bore of said first tube, said restrictor having an orifice through which a fluid can pass;

means for conducting an electric current to a first end of said first tube;

means for conducting an electric current to a second end of said first tube; and

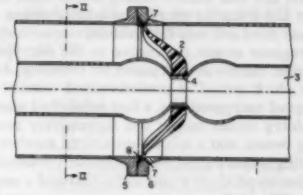
means for directing a fluid through said first tube.

4,447,671

FUNNEL-SHAPED SUPPORT INSULATOR AND A HIGH-VOLTAGE ARRANGEMENT USING THE SUPPORT INSULATOR

Franz Czech, Niederhasli, and Miroslav Subotic, Zürich, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Sep. 29, 1982, Ser. No. 426,958
Claims priority, application Switzerland, Oct. 8, 1981, 6448/81
Int. Cl.³ H02G 9/06; H01B 17/58, 9/04
U.S. Cl. 174—28 10 Claims



1. A funnel-shaped support insulator, comprising:

an insulator body having an outer edge and an orifice spaced inwardly from said edge for supporting at least one high-volatge conductor part,

said body having an at least partially convex surface terminating at said outer edge, and having a wall thickness which decreases from said orifice toward said outer edge,

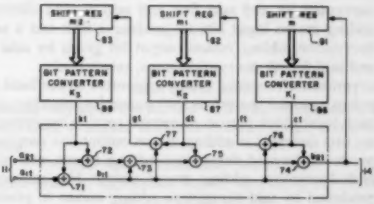
said outer edge having a plurality of lobes, said outer edge being free of control electrodes and being adapted for engaging at least one inner side of a metal housing.

4,447,672

DEVICE FOR ENCRYPTING EACH INPUT DATA BIT BY AT LEAST ONE KEYING BIT DECIDED BY A CODE PATTERN AND A BIT PATTERN OF A PREDETERMINED NUMBER OF PRECEDING ENCRYPTED BITS

Katsuhiro Nakamura, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1981, Ser. No. 308,244
Claims priority, application Japan, Oct. 6, 1980, 55-139596; Mar. 11, 1981, 56-34890
Int. Cl.³ H04L 9/00
U.S. Cl. 178—22.19 24 Claims



23. A decrypting device for decrypting a sequence of receive encrypted digits into a sequence of decrypted digits, said sequence of receive encrypted digits being substantially identical with a sequence of original encrypted digits produced by an encrypting device in response to a sequence of input data digits and a sequence of encryption clock pulses timing said input data digits and said original encrypted digits with a predetermined encryption clock period, each input data digit comprising a first and a second input data bit, each original encrypted digit comprising a first and a second original encrypted bit, each receive encrypted digit comprising a first and a second

receive encrypted bit, said encrypting device comprising modulo-two encryption adding means for calculating a first encryption sum modulo two of each first input data bit and at least one encryption keying bit to produce a sequence of the first original encrypted bits with each first original encrypted bit given by said first sum, a second encryption sum modulo two of each second input data bit, said at least one keying bit, each first original encrypted bit, and a first and a second encryption adding means input bit to produce a sequence of the second original encrypted bits with each second original encrypted bit given by said second sum, and a third and a fourth encryption sum modulo two of each first original encrypted bit and said first and said second adding means input bits to produce a first and a second encryption adding means output bit given by said third and said fourth sums, respectively, encryption shift register means responsive to the encryption clock pulses supplied thereto as shift pulses for retaining, during each encryption clock period, a predetermined number m of the second original encrypted bits, a first prescribed number m_1 of the first adding means output bits successively produced by said adding means, and a second prescribed number m_2 of the second adding means output bits successively produced by said adding means to produce a unit and a first and a second additional encryption shift register bit pattern represented by the m second original encrypted bits and the m_1 first and the m_2 second adding means output bits retained therein, respectively, encryption bit pattern converting means responsive to a unit and a first and at least one second additional code pattern for converting said unit and said first and said second additional shift register bit patterns to a unit and a first and at least one second additional converted encryption bit, respectively, and feedback means for supplying said unit and said first and said at least one second additional converted bits to said adding means as said first and said second adding means input bits and said at least one keying bit, respectively, wherein said decrypting device is responsive to a sequence of local clock pulses timing said receive encrypted digits and said decrypted digits with a local clock period equal to said encryption clock period and comprises:

modulo-two decryption adding means for calculating a first decryption sum modulo two of each first receive encrypted bit and at least one decryption keying bit to produce a sequence of the first decrypted bits with each first decrypted bit given by said first decryption sum, a second decryption sum modulo two of each second receive encrypted bit, said at least one decryption keying bit, each first receive encrypted bit, and a first and a second decryption adding means input bit to produce a sequence of the second decrypted bits with each second decrypted bit given by said second decryption sum, and a third and a fourth decryption sum modulo two of each first receive encrypted bit and said first and said second decryption adding means input bits to produce a first and a second decryption adding means output bit given by said third and said fourth decryption sums, respectively;

decryption shift register means responsive to the local clock pulses supplied thereto as shift pulses for retaining, during each local clock period, m second receive encrypted bits, m_1 first decryption adding means output bits successively produced by said decryption adding means, and m_2 second decryption adding means output bits successively produced by said decryption adding means to produce a unit and a first and a second additional decryption shift register bit pattern represented by the m second receive encrypted bits and the m_1 first and the m_2 second decryption adding means output bits retained therein, respectively;

decryption bit pattern converting means responsive to said unit and said first and said at least one second additional code patterns for converting said unit and said first and said second additional decryption shift register bit patterns to a unit and a first and at least one second additional converted decryption bit, respectively; and

feedforward means for supplying said unit and said first and said at least one second additional converted decryption bits to said decryption adding means as said first and said second decryption adding means input bits and said at least one decryption keying bit, respectively.

4,447,673

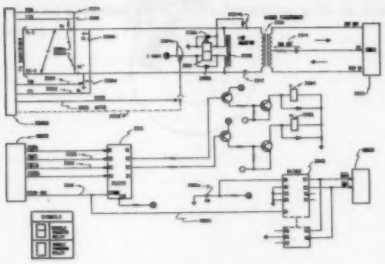
RING TRIP APPARATUS FOR A LINE CIRCUIT CONNECTED TO DCO SWITCH

George Elliott, Longwood; Pedro A. Lenk, Fern Park, and Jayantkumar R. Shah, Longwood, all of Fla., assignors to Stromberg-Carlson Corporation, Lake Mary, Fla.

Continuation of Ser. No. 063,660, Aug. 2, 1979, abandoned, which is a continuation of Ser. No. 924,770, Jul. 14, 1978, abandoned, which is a continuation-in-part of Ser. No. 864,401, Dec. 27, 1977, abandoned. This application Jul. 24, 1981, Ser. No. 286,750

Int. Cl.³ H04M *3/02*

U.S. Cl. 179—18 HB **18 Claims**



16. In a telephone switching system for selectively interconnecting subscriber telephone instruments in a telephone network, the telephone network further including a subscriber line of the type over which a d.c. signal indicates hook switch status of a corresponding subscriber telephone instrument and the telephone switching system including ringing generator means for generating an a.c. ringing signal, the improvement of a line circuit means connected to each subscriber line for generating a supervisory signal that indicates the presence of the d.c. hook status signal on the subscriber line in the presence or absence of the a.c. ringing signal, said line circuit means including:

A. d.c. signal generator means for generating a d.c. signal,

B. a bridge relay means having winding means connected in circuit with the corresponding subscriber line and contact means connected to said d.c. signal generator means for producing a supervisory signal that indicates whether the bridge relay means is energized,

C. ringing relay means including contact means for selectively coupling the ringing signal from the ringing generator means to said winding means thereby to energize the subscriber line with the ringing signal, and

D. shunting means connected to said winding means for enabling said bridge relay means to operate only in response to signals of a given polarity whereby the duty cycle of the supervisory signal indicates whether a d.c. signal is present in the subscriber line notwithstanding the presence of the a.c. ringing signal.

4,447,674

ELECTRONIC HOLD RELEASE CIRCUIT

Gary Grantland, Hartselle; Hugh S. Montgomery, Huntsville; Eduard F. B. Boeckmann, Huntsville, and Larry A. Woodworth, Huntsville, all of Ala., assignors to GTE Automatic Electric Inc., Northlake, Ill.

Filed Nov. 26, 1982, Ser. No. 444,760

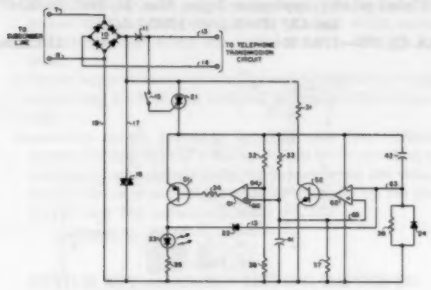
Int. Cl.³ H04M *1/00*

U.S. Cl. 179—81 R **11 Claims**

1. A hold release circuit for use with at least one telephone

instrument and a hold circuit, said hold circuit connected to a subscriber line and a source of line voltage and said telephone instrument disconnected from said subscriber line, said hold release circuit comprising:

first and second switching devices normally turned on connecting said hold circuit to said subscriber line;



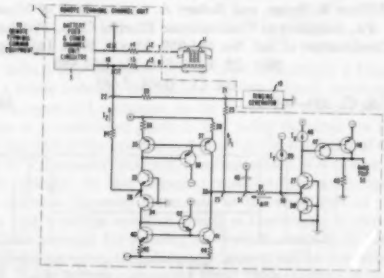
sensing means connected to said second switching device arranged to produce an output signal responsive to said telephone instrument being connected to said line, turning said second switching device off; and

load circuit means connected to shunt said first switching device responsive to said second switching device turning off, causing said first switching device to turn off and release said hold circuit.

4,447,675
RING-TRIP DETECTOR

Tom D. Arntsen, Convent Station, and Rouben Toumani, Randolph, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 29, 1982, Ser. No. 437,804
Int. Cl.³ H04M *3/06*
U.S. Cl. 179—84 R **6 Claims**



1. A ring-trip detector circuit for the remote terminal of a subscriber loop carrier system comprising

remotely located ringing signal generating means,

resistance means having first and second opposed terminal nodes in series with said ringing signal generating means,

CHARACTERIZED BY

means for holding first and second low impedance nodes at near ground potential,

means for directly deriving from the voltage across said resistance means relatively small first and second currents and feeding said currents to said first and second low impedance nodes, respectively,

means for forming a difference signal from said first and second currents,

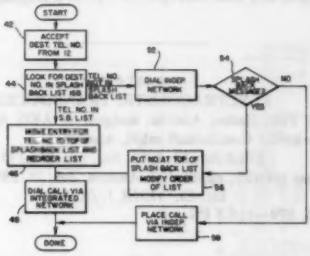
means for filtering AC components from said difference signal, and

means for generating a ring-trip signal when the filtered difference signal exceeds a predetermined threshold level.

4,447,676
AUTOMATIC DIALER FOR TELEPHONE NETWORK ACCESS CONTROL

William J. Harris; Joseph M. Jackson, and David C. Petty, all of Cambridge, Mass., assignors to Telelogic, Inc., Cambridge, Mass.

Filed Feb. 24, 1983, Ser. No. 469,277
Int. Cl.³ H04M *1/27*
U.S. Cl. 179—90 BD **9 Claims**


START
ACCEPT DEST. TEL. NO. FROM 12
LOOK FOR DEST TEL. NO. IN SPLASH BACK LIST
TEL. NO. IN SPLASH BACK LIST
TEL. NO. NOT IN SPLASH BACK LIST
DIAL INDEP. NETWORK
SUCCESSFUL?
NO
YES
TEL. NO. IN I.S.B. LIST
MAKE ENTRY FOR TEL. NO. TO TOP OF SPLASHBACK LIST AND REORDER LIST
PUT NO. AT TOP OF SPLASH BACK LIST
MODIFY ORDER OF LIST
DIAL CALL VIA INTEGRATED NETWORK
PLACE CALL VIA INDEP. NETWORK
DONE

1. An automatic telephone dialer for use in accessing a long-distance telephone network, comprising:

(a) a memory having a plurality of locations, each location being suitable for storing an entry indicating a group of telephone numbers not accessible via the long-distance network;

(b) means for comparing a telephone number being called with the entries in the memory and, responsive to such comparison, routing the call to the long-distance network if the number being called is not within a group of telephone numbers represented by the entries in the memory; and

(c) means for writing into said memory an indication of a telephone number called on the long-distance network when that number is found to be inaccessible via that network, whereby the directory may be compiled in said memory in response to failed attempts to access the network.

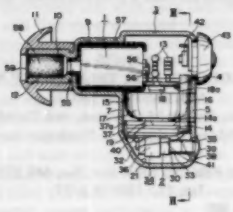
4,447,677
HEARING AID

Katsunobu Miyahra, Tokyo, and Nobuyuki Matsumoto, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 9, 1982, Ser. No. 367,214
Claims priority, application Japan, Apr. 20, 1981, 56-56687
Int. Cl.³ H04R *25/00*
U.S. Cl. 179—107 R **5 Claims**

1. A hearing aid comprising a housing, a microphone for converting a received sound into an electrical signal, said microphone being mounted in said housing and having a first diaphragm, and a reproducing transducer for converting said electrical signal into sound, said reproducing transducer being mounted in said housing and having a second diaphragm, wherein the first diaphragm and second diaphragm are placed in different locations and their respective planes of vibrations are placed at an angle relative to each other, and wherein said microphone is supported by a supporting member made of an elastic material, said supporting member comprising a first

portion fixed to a solid member and a second portion connected to said first portion at a predetermined angle and having



a free end, and said microphone is placed on said second portion.

4,447,678

ELECTRACOUSTIC TRANSDUCER

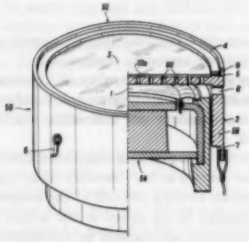
Werner Fidi, Baden, Austria, assignor to AKG Akustische u.-Kino-geräte Gesellschaft mbH, Austria

Filed Jul. 23, 1981, Ser. No. 286,175

Claims priority, application Austria, Jul. 28, 1980, 3920/80

Int. Cl.³ H04R *1/28, 1/24*

U.S. Cl. 179—115.5 PS **15 Claims**



15. An electroacoustic two-way transducer assembly consisting essentially of:

a cylindrical outer wall portion having a top end and an open bottom end;

a flat disc shaped back plate extending across the top end of said cylindrical outer wall portion having a plurality of spaced apertures therethrough, said cylindrical outer wall portion and said back plate made of electrically conducting material;

an electrodynamic system disposed in said cylindrical outer wall portion below said back plate and having an electrodynamic diaphragm spaced below said back plate;

said cylindrical outer wall portion including a plurality of apertures therethrough communicating with the space between said back plate and said electrodynamic diaphragm;

said cylindrical outer wall portion including a rim extending upwardly of said back plate and including an inwardly extending step disposed upwardly of said back plate;

an electrostatic treble system diaphragm extending over said back plate at a spaced location with said back plate and resting on said inwardly extending step; and

a retaining ring engaged on said step and over said electrostatic treble system diaphragm for retaining said treble system diaphragm on said step;

said electrostatic treble system diaphragm and spaced back plate with apertures therethrough forming an electrostatic treble system above said electrodynamic system.

4,447,679

SUBSCRIBER LINE TESTING SYSTEM

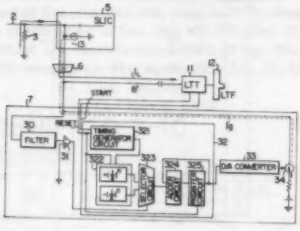
Takafumi Kojima, Yokohama; Shigeru Yoshida, Kodaira, and Masayuki Mizoguchi, Tokorozawa, all of Japan, assignors to Hitachi, Ltd. and Nippon Telegraph & Telephone Public Corporation, both of Tokyo, Japan

Filed Mar. 22, 1982, Ser. No. 360,847

Claims priority, application Japan, Mar. 23, 1981, 56-40347

Int. Cl.³ H04B *3/46*; H04M *3/30*

U.S. Cl. 179—175.3 R **12 Claims**



1. A testing system for testing a subscriber line and a terminal equipment connected to the subscriber line with a connection of the testing system with the subscriber line through a switch, said testing system comprising:

a semiconductor switch of the type driven by a constant current for connecting a subscriber line to a test equipment through a test line; and

a compensation circuit including means for measuring said constant current component of said semiconductor switch in a current flowing through said switch into said test line, and means for drawing said constant current component measured by said measuring means away from said test line so as to feed only the current except said constant current component to said test equipment via said test line.

4,447,680

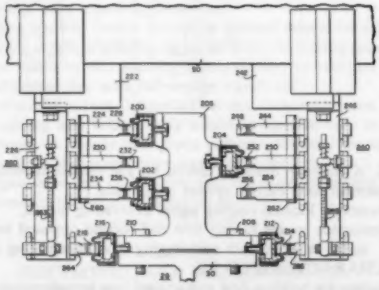
POWER COLLECTION APPARATUS FOR A TRANSPORTATION SYSTEM

William R. Segar, and Robert A. Larson, both of Monroeville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 684,058, May 6, 1976. This application Nov. 20, 1978, Ser. No. 962,550

Int. Cl.³ B60L *5/40*

U.S. Cl. 191—48 **10 Claims**



1. In power collection apparatus for a vehicle having an electrical propulsion motor and being operative with a track having a vehicle support surface, with said track including one rail positioned below the vehicle support surface and being continuous through a predetermined area of the track and including a power rail positioned above the vehicle support

surface and not being continuous through said predetermined area of the track, the combination of

first collector means operative with said one rail and positioned below the vehicle support surface such that said one rail determines the position of the first collector means when the vehicle travels through said area,

second collector means operative with said power rail and positioned above the vehicle support surface such that the power rail does not determine the position of the second collector means when the vehicle travels through said area,

collector support means carried by said vehicle for pivotally supporting each of said first and second collector means, and

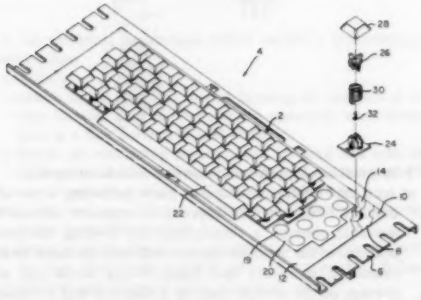
connection means provided between said first collector means and said second collector means for controlling the position of said second collector means when the vehicle travels through said area and as determined by the position of said first collector means.

4,447,681

SWITCH KEY ASSEMBLY HAVING IMPROVED SWITCH ACTUATION

Mark R. Desmarais, Derry, N.H., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 22, 1983, Ser. No. 468,732
Int. Cl.³ H01H *13/70, 3/00*
U.S. Cl. 200—5 A **19 Claims**



1. A switch key assembly of the type comprising a frame having a frame column, the column having a fixed lower end and a free upper end, a plunger on the frame, the plunger being normally in an extended position and being movable on the column parallel to the axis thereof towards the fixed end of the column to a depressed position, a spring which is effective to bias the plunger to the extended position, normally open switch contacts disposed proximate to the fixed end of the column, and a switch actuator which is responsive to movement of the plunger for moving the switch contacts to their closed positions when the plunger is moved to the depressed position, the switch key assembly being characterized in that:

the switch actuator comprises a bell crank having an actuator arm and a cam follower arm, the bell crank being pivotally mounted on a pivotal axis which is proximate to the fixed end of the column and which extends transversely of the axis of the column,

the cam follower arm extending beside the axis of the column and the actuator arm extending transversely of the axis of the column, the actuator arm having an actuator portion which is adjacent to the switch contacts and which is movable towards the switch contacts and which closes the switch contacts upon rotary movement of the bell crank in a first direction,

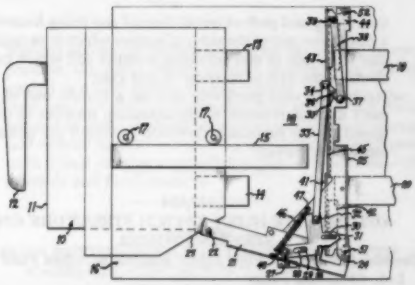
the cam follower arm having a first cam follower portion and the plunger having a first cam surface thereon which cooperates with the first cam follower portion to cam the bell crank in the first direction upon movement of the plunger to the depressed position whereby, upon movement of the plunger from the extended position to the depressed position, the switch contacts are closed, and upon return of the plunger to the extended position, the bell crank rotates in a second direction, which is opposite to the first direction, and the switch contacts are opened.

4,447,682

ISOLATION SHIELDS FOR A 2500-4000 AMP CIRCUIT BREAKER COMPARTMENT

Roger N. Castonguay, Terryville, Conn., assignor to General Electric Company, New York, N.Y.

Filed Feb. 16, 1982, Ser. No. 349,335
The portion of the term of this patent subsequent to May 31, 2000, has been disclaimed.
Int. Cl.³ H01H *9/00*
U.S. Cl. 200—50 AA **8 Claims**



1. A shield operating mechanism for a circuit breaker compartment comprising:

a side support frame;

an upper moveable shield hingeably attached to a top portion of said side support frame;

a lower moveable shield hingeably attached to a bottom portion of said support frame;

a primary operating arm hingeably attached to said bottom portion of said side support frame for contacting a rear portion of a circuit breaker;

an upper and a lower expansion link interconnected by means of a rotatably mounted connecting link, said lower expansion link connected with means for opening said lower moveable shield when said primary operating arm is moved in a downward direction and said upper expansion link containing means for opening said upper moveable shield when said primary operating arm is moved in a downward direction.

4,447,683

AUTOMOTIVE BLINKER OR TURN INDICATOR SWITCH

Michel Nigon, Sartrouville, France, assignor to Automobiles Peugot and Automobiles Citroen, both of, France

Filed Dec. 18, 1981, Ser. No. 332,228
Claims priority, application France, Dec. 24, 1980, 80 27532
Int. Cl.³ H01H *3/16*
U.S. Cl. 200—61.27 **6 Claims**

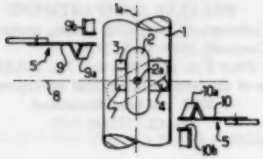
1. Automotive blinker or turn indicator switch apparatus for a vehicle, having an actuating member which is movable in two directions, said switch apparatus adapted to make or break an electric circuit including at least one blinker, comprising:

cam mounting means including shaft means fixed at one of its ends to the actuating member;

an elongated cam pivotally mounted on a free end of said shaft means for free rotation with respect to said shaft means about an axis of rotation, said cam describing a path of travel upon movement of the actuating member;

stop means mounted on said mounting means for limiting the free rotation of said cam to an angle of less than 90° in either the clockwise or counter-clockwise direction, said stop means including plate means fixedly mounted on said shaft means and a pair of stop members secured on said plate means; and

a pair of parts for making and breaking the electric circuit, each part being mounted at a respective lateral side of said



cam along said path of travel thereof and being located on a respective one of the sides of a plane which is perpendicular to an axis of said actuating member and which passes through the axis of rotation of said cam;

whereby said cam positively acts on a certain one of said parts upon movement of the actuating member as determined by the particular direction in which the actuating member is moved.

4,447,684

AUTOMOTIVE HORN SWITCH STRUCTURE ON STEERING WHEEL

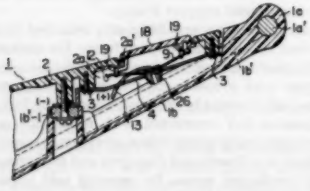
Tomokazu Sugiyama, Fuji, Japan, assignor to Nihon Plast Co., Ltd., Shizuoka, Japan

Filed Jul. 15, 1983, Ser. No. 514,232

Claims priority, application Japan, Jul. 16, 1982, 57-108278[U]

Int. Cl.³ H01H 9/00

U.S. Cl. 200—61.54 **6 Claims**



1. An automotive horn switch structure mounted on a steering wheel having a horn button, comprising a contact plate secured to said steering wheel, a horn spring and a fastener of an electrically insulating material securing said contact plate and said horn spring together such that said contact plate and said horn spring are electrically insulated from each other, said horn spring having at least one integral contact point adapted to be actuated by said horn button into contact with said contact plate, said contact plate being electrically connected to one of plus and minus terminals of an electric power source and said horn sprng being electrically connected through an electric wire to an electrically energizable horn electrically connected to the other terminal of said power source whereby, when said contact point of said horn spring is actuated by said horn button into contact with said contact plate, said horn is electrically energized, said fastener including a base having first and second surfaces and self-locking resilient legs formed integrally with said base extending from said first surface and cooperating with said base to secure said contact plate to said fastener, wherein said fastener further includes a pair of spaced self-locking resilient pawls integrally formed with said base, extending from said second surface thereof and having locking claws extending toward each other, said self-locking pawls cooperating with said base to grasp and hold a part of said horn plate between said second surface of said base and said locking claws, said electric wire having a part grasped and held between said part of said horn plate and said second surface of said base so that said wire is electrically connected to said horn plate.

4,447,685

SMALL-SIZED PUSH-BUTTON SWITCH

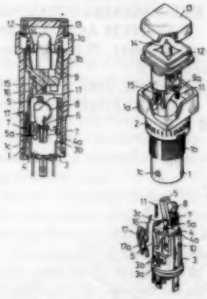
Shigeo Ohashi; Tadashi Nakamura, and Koji Kamisada, all of Tokyo, Japan, assignors to Nihon Kaiheiki Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1982, Ser. No. 425,367

Claims priority, application Japan, Feb. 28, 1982, 57-27622[U]; Feb. 28, 1982, 57-27623[U]

Int. Cl.³ H01H 13/46

U.S. Cl. 200—67 D **9 Claims**



1. A small-sized push-button switch which comprises:

at least one switch mechanism, each including a movable contact, fixed contacts disposed on opposite sides of the movable contact, a switch base for holding the lower portions of the movable contact and fixed contacts, an arm extending upwardly and being swung about one side portion of the switch base as a fulcrum and a resilient piece provided between the arm and the movable contact,

a switch auxiliary base for holding the switch mechanism therein,

a plunger having a push-button provided at the top and an inclined surface provided on the bottom thereof said plunger disposed on the arm so that the inclined surface of the plunger is slidable on the outer top surface of the arm, said plunger causing the arm to be swung in a direction by depression of the push-button and causing the movable contact to be moved in the other direction due to the action of the resilient piece whereby a switching operation is made,

the direction of movement of the plunger, the movable contact and fixed contacts being disposed vertically,

a heart cam formed on one side of the plunger for the heart cam being provided under the lower portion thereof with a cut-out,

a resilient plate attached to the switch auxiliary base disposed below the plunger and provided with an aperture, and

a hook pin adapted to be pushed toward the heart cam from the outside and folded at upper and lower ends in opposite directions, one end of the hook pin being inserted into the aperture of the resilient plate to form a fulcrum and the other end of the hook pin being engaged with the heart cam through the cut-out, the positions where the heart cam and the hook pin are disposed being made as a recess

whereby said plunger maybe latched in a depressed position by said cam and pin.

4,447,686

PUSHBUTTON SWITCH OR PUSHBUTTON-ACTUATED SLIDE SWITCH

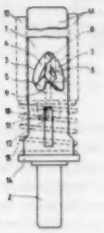
Werner H. Fieber; Klaus Hinze; Manfred K. O. Huth; Hans-Georg Jost; Klaus D. Lamm; Dieter Michalski, and Konstantin Rittaler, all of Berlin, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Dec. 6, 1982, Ser. No. 447,202

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1981, 3148855

Int. Cl.³ H01H *9/26, 9/20*

U.S. Cl. 200—153 J **1 Claim**



1. An electrical pushbutton switch assembly comprising, in combination:

a housing;

a switch slider mounted in said housing for reciprocal motion therein, said slider having a generally heart-shaped cam in a first surface of said slider;

a detent pin extending through said housing and into said cam and said cam having a plurality of curved paths for receiving and guiding said detent pin therein;

a return spring resiliently urging said slider in a direction away from said housing;

a detent profile provided in a surface of said slider adjacent to said first surface with said detent profile defining latched and released slider positions; and,

a detent bar movably mounted adjacent to said housing for reciprocal motion in a direction perpendicular to the direction of motion of said slider, said detent bar being resiliently biased toward said detent profile, said detent bar having a first projection extending into and engaging said detent profile, and said detent bar having a second projection extending toward and engaging said detent pin thereby to move said detent bar in response to relative movement of said detent pin with respect to said cam when the relative movement of said detent pin is along a selected one of said curved paths, whereby said detent pin moves said first projection away from said detent profile when the relative movement of said detent pin is along said selected curved path and toward the released slider position.

4,447,687

PUSHBUTTON SWITCH

Erich Marquardt, Rietheim-Weilh., and Ekkehard Sachs, Spaichingen, both of Fed. Rep. of Germany, assignors to Marquardt GmbH, Fed. Rep. of Germany

Filed Sep. 10, 1982, Ser. No. 416,546

Int. Cl.³ H01H *13/66*

U.S. Cl. 200—159 R **23 Claims**

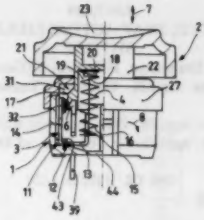
1. A pushbutton switch comprising:

a casing having an electrically non-conducting fixed bearing therein;

a button movably mounted with respect to said casing in an actuating direction and from an open position to a closed position, said button having a cam surface;

a contact member having at least two legs joined at an angle junction, said angled junction pivotally mounted on said fixed bearing for permitting pivotal movement of said contact member;

biasing means engaged between one of said contact member



legs and said button for biasing said button toward its open position, the other of said contact member legs bearing against said cam surface of said button;

at least one movable contact mounted on said contact member and at least one fixed contact mounted in said casing, said contact member movable by movement of said button to its closed position to establish engagement between said movable and fixed contacts.

4,447,688

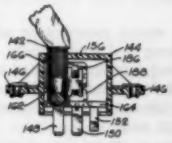
PUSH BUTTON SWITCHES HAVING IMPROVED CARRIAGE, CONTACTOR AND CONTACT CONSTRUCTIONS

William J. Schaad, Winnetka; Charles E. Black, III, Mount Prospect, and Raymond T. Halstead, Wheeling, all of Ill., assignors to Indak Manufacturing Corp., Northbrook, Ill.

Division of Ser. No. 287,690, Jul. 28, 1981, Pat. No. 4,392,029. This application Sep. 23, 1982, Ser. No. 421,820

Int. Cl.³ H01H *3/12*

U.S. Cl. 200—159 R **20 Claims**



1. A push button switch, comprising

a push button,

a casing having guide means for guiding said push button along a path between extended and depressed positions,

resilient means biasing said push button toward said extended position,

a carriage member extending laterally in one lateral direction from said push button in said casing,

a conductive contactor mounted on said carriage member and movable with said carriage member in said casing along a path which is parallel with the path of said push button,

said contactor facing in a transverse lateral direction relative to said one lateral direction,

contact means in said casing and selectively engageable by said contactor,

and spring means acting in said transverse lateral direction between said carriage member and said contactor to afford spring pressure between said contactor and said contact means,

said spring means having a line of action spaced in said one lateral direction from the center line of said push button and thereby tending to cause twisting rotation of said push button,

said guide means including stabilizing means for stabilizing said push button against such twisting rotation due to the transverse lateral force of said spring means.

4,447,689

SLIDE ACTUATED, SNAP ACTING MULTIPLE ROCKER SWITCH

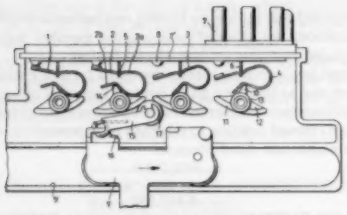
Werner Schiller, Erzhausen, Fed. Rep. of Germany, assignor to Max Kammerer GmbH, Oberursel/Taunus, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,398

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1981, 3144740

Int. Cl.³ H01H *3/20*

U.S. Cl. 200—330 **15 Claims**



1. A slide actuated, snap acting multiple rocker switch comprising:

a plurality of contact springs each being in the shape of a loop and each being mounted on a pivot member and having a contact point at one end and a catch adjacent the opposite end,

a corresponding roll member for each of said contact springs, each of said roll members being mounted for rotation about an axis, and each of said roll members having two cams forming a rocker and a third cam engaging said catch,

guide means,

switching slide means mounted on said guide means for movement along said guide means, said switching slide means including a portion adapted to contact successive ones of said rockers as said switching slide means is moved along said guide means for successive actuation of said contact springs, and

said rockers being so spaced that adjacent ones of said rockers form a detent for said switching slide means between adjacent ones of said rockers.

4,447,690

INDUCTIVE PREHEATING OF UPSET TUBING

Arnold J. Grever, Colmar, Pa., assignor to Selas Corporation of America, Dresher, Pa.

Filed Dec. 28, 1981, Ser. No. 335,189

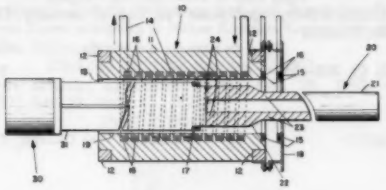
Int. Cl.³ H05B *6/40*

U.S. Cl. 219—10.43 **4 Claims**

1. In a method of heating an object to a substantially uniform temperature, said object having at least one portion tending to absorb energy at a higher rate when heated and at least one other portion tending to absorb energy at a lower rate when heated, the steps comprising:

a. subjecting said portions of said object of induction preheating in a magnetic field, produced by an energized induction coil having a plurality of turns and at least one robber coil having at least one turn and placed within the magnetic field produced by said energized induction coil in close proximity to said portion of said object tending to absorb energy at a higher rate, while said object is positioned at a predetermined position within said magnetic field;

b. controlling said magnetic field in a manner to provide controlled portions including one magnetic field portion adjacent said portion of said object which tends to absorb energy at a lower rate, thereby heating said portion of said object to a predetermined temperature, and further including another magnetic field portion adjacent said portion of said object which tends to absorb energy at a



higher rate, wherein said magnetic field portion is of lesser magnitude than the magnetic field portion first mentioned, thereby heating said portion tending to absorb energy at a higher rate to a temperature which is lower than said predetermined temperature first mentioned;

c. continuing the induction preheating of said portions of said object to reach said different predetermined temperatures at said different portions of said object;

d. removing said object from said magnetic field; and

e. post-heating said object with a separate heating means to a substantially uniform temperature.

4,447,691

CIRCUIT FOR DETECTING A UTENSIL LOAD PLACED ASYMMETRICALLY RELATIVE TO AN INDUCTION HEATING COIL

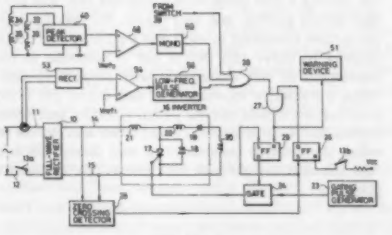
Takumi Mizukawa, Neyagawa; Keizo Amagami, Takatsuki, and Takao Kobayashi, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Jul. 30, 1980, Ser. No. 173,802

Claims priority, application Japan, Jul. 31, 1979, 54-98218; Jul. 31, 1979, 54-98219

Int. Cl.³ H05B *6/12*

U.S. Cl. 219—10.49 R **49 Claims**



1. An induction heating cooking apparatus having an ultrasonic frequency energy source powered by a low frequency energy source, and a spirally wound induction heating coil of a flat configuration energized by said ultrasonic frequency energy source to provide an ultrasonic frequency magnetic field, the coil being mounted below a top plate on which a utensil is placed, comprising:

means positioned and oriented to be responsive to the magnetic field for detecting when said ultrasonic frequency magnetic field has an asymmetric distribution of energy

with respect to the center of said heating coil in response to said utensil being located asymmetrically with respect to said center and for deriving a signal indicative of the displacement of said utensil from said center; and

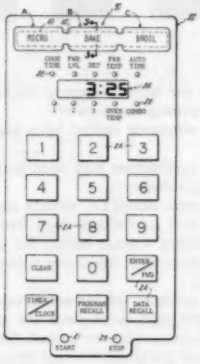
means for generating a warning signal in response to said displacement indicative signal having a value associated with at least a predetermined assymmetric displacement.

4,447,692

CONTROL SYSTEM WITH INTERACTIVE DISPLAY

Eugene P. Mierzwinski, Fort Wayne, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed May 18, 1981, Ser. No. 264,731
Int. Cl.³ H05B 9/06
U.S. Cl. 219—10.55 B **21 Claims**



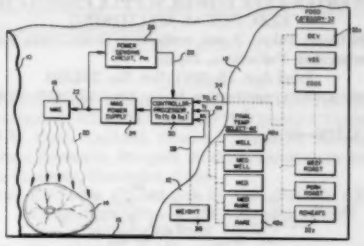
1. A control system for an appliance having controlled devices operative in a plurality of selectable modes, each said mode comprising one or more respective operating sequences, said control system including storage means and electronic control means operable to effect the operating sequences of selected ones of said modes, representations of a plurality of symbols being stored in said storage means, said representations being representative of respective ones of said operating modes, display means, means for retrieving said symbol representations from storage and displaying said representations so retrieved at said display means as corresponding symbols in a plurality of groups of symbols, each said symbol group having at least one symbol and being displayed separately in time from the other said groups, respective manually operated adaptive input means associated with and positioned in visual proximity with each symbol in a said displayed group of symbols, said electronic control means being responsive to operation of a said adaptive input means during display of a respective mode symbol thereat for subsequently effecting the operating sequence associated with the respective said displayed mode symbol, and further including a plurality of manually operated dedicated input means each being for the input of fixed data to said control means and storage means, said control means and storage means being responsive to the input of said data from said dedicated input means directly following operation of a particular said adaptive input means during display of a respective particular mode symbol thereat for at least partly defining said operating sequence of said respective operating mode.

4,447,693

POWER CONTROLLED MICROWAVE OVEN

Ronald G. Buck, Burnsville, Minn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Division of Ser. No. 73,077, Sep. 6, 1979. This application Oct. 22, 1981, Ser. No. 313,904
Int. Cl.³ H05B 9/06
U.S. Cl. 219—10.55 M **7 Claims**



1. In a microwave oven including a microwave energy source for heating food, a method for controlling the cooking of said food comprising the steps of:

determining the absorbed power in said food during cooking;

determining the average temperature of said food being heated using the derived absorbed power and cooking parameters in the relationship:

$$T_e = T_o + a_1[(P_a)t/M] + a_2[(P_a)t/M]^2 + a_3[(P_a)t/M]^3$$

where,

T_o is the initial food temperature,

P_a is the absorbed power in the food,

t is the food cooking time,

M is the initial food mass, and

a_1, a_2, a_3 are coefficients relating to food weight loss and are determined experimentally for various food categories and masses; and

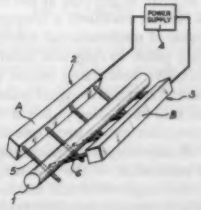
repetitively performing the above steps until the determined value of average food temperature, T_e, substantially equals the predetermined final value of average food temperature, T_f.

4,447,694

APPARATUS FOR BREAKING UP METAL PARTS

Michel Brochier, Jarrie, and Jean Chavand, Grenoble, both of France, assignors to Commissariat a l'Energie Atomique, France

Filed Oct. 19, 1981, Ser. No. 312,773
Claims priority, application France, Oct. 23, 1980, 80 22683
Int. Cl.³ B23P 1/02; B02C 19/00
U.S. Cl. 219—68 **1 Claim**



1. An apparatus for breaking up filiform metallic parts, comprising at least two fixed conductive supports connected to an electric power supply, each able to at least partly support

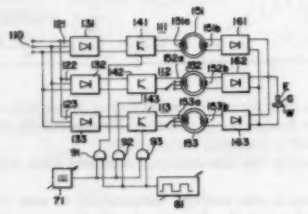
parts to be broken up, the two conductive supports being constituted by two comb-like members whose teeth are respectively meshed, the teeth of the comb-like members being parallel to each other and respectively located on two planes oriented so that the two comb-like members form a funnel, and said teeth being made of graphite.

4,447,695

INVERTER-TYPE POWER SUPPLY CIRCUIT FOR ELECTRICAL MACHINING

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Apr. 15, 1981, Ser. No. 254,300
Claims priority, application Japan, May 13, 1980, 55-63716
Int. Cl.³ B23P *1/08*
U.S. Cl. 219—69 C 7 Claims



1. A power supply circuit for electrical machining, comprising:

a plurality of inverter circuits connectable in parallel with one another to have their respective input sides connected jointly to a common source of commercial alternating current and their respective output sides connected jointly to a single electrical machining gap, each of said parallel inverter circuits individually comprising:

a transformerless input means connectable directly to said common source of alternating current of a commercial supply frequency and an original voltage,

a rectifier means connected to said input means directly for converting said commercial alternating current to a direct current at said original voltage, and

a high-frequency transformer having a primary winding connected via a high-frequency switch means to the output of said rectifier means and a secondary winding connectable via further rectifier means to said single electrical machining gap;

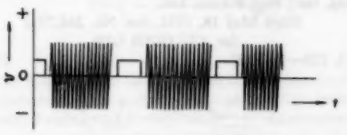
a common pulsing means for said plurality of the high-frequency switch means and for supplying thereto in unison a succession of signal pulses and thereby pulsing each of said direct currents at the respective outputs of said plural rectifier means to provide a succession of transformed alternating output pulses of a desired voltage level and with time parameters corresponding to said succession of signal pulses at each of said plural high-frequency transformers and, in turn, to provide at the respective outputs of said plural further rectifiers a concurrently occurring plurality of trains of unidirectional machining pulses with each machining pulse having said desired voltage level and with successive machining pulses corresponding in time parameters to successive signal pulses and eventually to superimpose said machining pulses at the outputs of said plural further rectifier means upon one another to provide a succession of superimposed machining pulses and for applying said succession of the superimposed machining pulses across said single electrical machining gap, at least one of said high-frequency transformers having a plurality of settings of the ratio of transforming said original voltage to said desired voltage level, which settings are capable of selectively establishing the voltage and current characteristics of said superimposed machining pulses.

4,447,696

PROCESS AND APPARATUS FOR HIGH FREQUENCY DISCHARGE SHAPING OF A WORKPIECE BY MEANS OF A RECTANGULAR BIPOLAR PULSATING VOLTAGE

Yoshiei Niwa, Yokohama, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 47,819, Jun. 12, 1979, abandoned, which is a continuation of Ser. No. 766,347, Feb. 7, 1977, Pat. No. 4,211,908, which is a continuation of Ser. No. 548,019, Feb. 7, 1975, abandoned. This application Sep. 3, 1981, Ser. No. 299,197
Claims priority, application Japan, Feb. 19, 1974, 49-19130; Feb. 19, 1974, 49-19134; Feb. 19, 1974, 49-19131; Feb. 19, 1974, 49-19132; Feb. 19, 1974, 49-19133; Feb. 19, 1974, 49-25309; Feb. 19, 1974, 49-25210; Feb. 19, 1974, 49-25311; Feb. 19, 1974, 49-25312; Mar. 6, 1974, 49-25313
Int. Cl.³ B23P *1/08*
U.S. Cl. 219—69 P 4 Claims



1. A process for high frequency discharge shaping of a work-piece comprising the steps of:

providing an electrode spaced by a gap from said work-piece;

generating an intermittent high frequency rectangular bipolar pulsating voltage;

generating an intermittent DC voltage and applying said DC voltage to said intermittent high frequency rectangular bipolar pulsating voltage during the quiescent period of said intermittent high frequency voltage to form a resultant voltage;

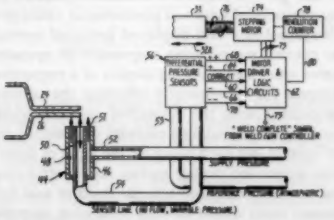
applying said resultant voltage across said gap between said electrode and said work-piece for accomplishing said discharge shaping whereby a black film is formed on the surface of said electrode to retard the consumption of said electrode and whereby the accuracy in the shape of the work-piece is improved.

4,447,697

WELD GUN REPOSITIONING SYSTEM FOR PROGRAMMABLE MANIPULATOR

Maurice J. Dunne, Newtown, and Klaus W. Nielsen, Brookfield Center, both of Conn., assignors to Unimation, Inc., Danbury, Conn.

Continuation of Ser. No. 891,000, Mar. 28, 1978, abandoned. This application Mar. 2, 1983, Ser. No. 471,304
Int. Cl.³ B23K *11/10*
U.S. Cl. 219—86.41 33 Claims



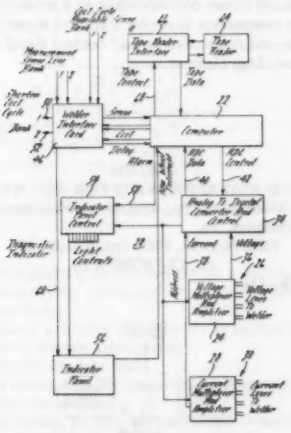
1. In a programmable manipulator, the combination of, a manipulator arm, means for moving said arm in a plurality of

axes, means for generating command signals during a playback cycle, means controlled by said command signals for controlling said arm moving means to move said arm over a desired path relative to a workpiece, a weld gun positioned on the end of said arm and operative to perform a series of spot welds at predetermined points along said path during said playback cycle, means for sensing the relationship between said weld gun and a predetermined portion of the workpiece immediately after a spot weld is made at one of said predetermined points, and means controlled by said sensing means for modifying said path by successive predetermined increments as said arm is moved to successive ones of said predetermined points, thereby to maintain said gun in generally fixed relation to said predetermined portion of the workpiece.

4,447,698
WELDING SYSTEM MONITORING AND CONTROL SYSTEM

Truman T. Van Sikle, Saline, and Charles J. Drake, Detroit, both of Mich., assignors to Kelsey Hayes Company, Romulus, Mich.

Continuation of Ser. No. 338,453, Mar. 6, 1973. This application Dec. 18, 1974, Ser. No. 534,066
Int. Cl.³ B23K *11/24*
U.S. Cl. 219—110 **58 Claims**

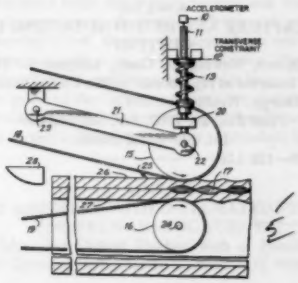


1. A welding control system for a pulse welder having a welding cycle including heat portions and cool portions, the pulse welder including at least one welding head, a source of welding pulses of preselected duration, a standard control circuit for generating a standard connected between the source and the welding head for controlling the application of alternate of the head and cool portions to a welding load by controlling the number of welding pulses fed to the load during the heat portion and the duration of the cool portion, the standard control circuit including means for generating a series of clock pulses for controlling the duration of the heat and cool portions of the welding cycle of the load by counting a preselected number of clock pulses in the heat and cool portions of the cycle, the improvement comprising means connected to the standard control circuit for altering the duration of the heat and/or cool portions of the cycle counted by the standard control including sensing means for sensing a first set of voltage and current characteristics flowing in the load during a heat portion, means for generating a varying standard impedance characteristic from said sensed first set of voltage and current characteristics flowing in the load, an interface circuit connected to the current and voltage sensing means and said impedance characteristic generating means for feeding the voltage and current signals to said impedance characteristic generating means, said sensing means sensing and feeding a second set of voltage and current characteristics to said impedance characteristic generating means, said generating means generating a second impedance characteristic from said second set, and means for comparing said second impedance characteristics of the weld with the standard impedance characteristic and generating a pulse by pulse altering signal when the sensed impedance characteristic is not within the generated standard characteristics, said altering means connected to the standard control for altering the heat and/or cool portions to maintain said second impedance characteristic within limits of said standard characteristic.

4,447,699
CLOSED LOOP CONTROL OF CONTINUOUS SEAM RESISTANCE HEATED FORGE WELDING CYLINDERS

Vance B. Gold, Lombard; Edward F. Kubacki, Marengo, and Thomas Krewenka, Prospect, all of Ill., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 173,761, Jul. 30, 1980, Pat. No. 4,376,884. This application Nov. 5, 1982, Ser. No. 439,551
Int. Cl.³ B23K *11/24*
U.S. Cl. 219—110 **4 Claims**



1. A method for using an electrical signal from a pulsing resistance and mechanical force welding process applied across a thin metallic juncture including the following steps:
- monitoring the relative acceleration of a resistance welding electrode during a welding operation,
- providing a signal which is representative of the variations in said electrode acceleration,
- filtering said acceleration signal into that which represents electrode acceleration, and
- adjusting the relative power through said welding electrode to achieve an acceptable electrode acceleration.

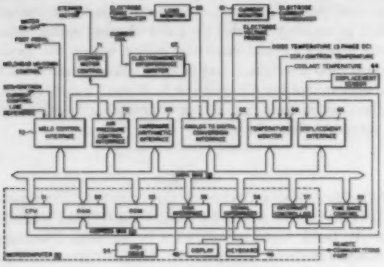
4,447,700
RESISTANCE SPOT WELDER ADAPTIVE CONTROL

Robert K. Cohen, Troy, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 7, 1982, Ser. No. 386,153
Int. Cl.³ B23K *11/24*
U.S. Cl. 219—117.1 **17 Claims**

1. A method of controlling a resistance spot welding process practiced on a welding machine which applies an electrode mechanical load to the workpieces and has a primary circuit and a secondary circuit that supplies power to the electrodes, comprising the steps of:
- diagnosing the condition of said workpieces and machine before welding by measuring certain variables and determining that these variables are within predefined limits;
- applying power pulses to weld said workpieces, measuring workpiece thermal expansion and expansion rate after every welding pulse and comparing respectively to a known target maximium expansion and to preset expansion rate limits, and dynamically adjusting the welding

power as a function of workpiece thermal expansion and rate of expansion in order to control the formation of a weld nugget; and



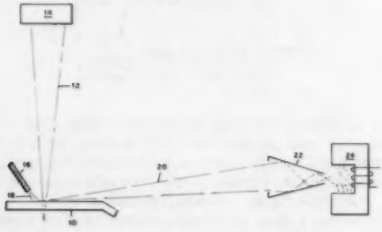
supplying additional power pulses and dynamically adjusting the welding power after every power pulse to control the cooling rate and temper the welded workpiece.

4,447,701

SLAG CAPTURE AND REMOVAL DURING LASER CUTTING

Clyde O. Brown, Newington, Conn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 28, 1982, Ser. No. 343,609
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LG **5 Claims**



1. A method for cutting a austinetic stainless steel workpiece and collecting slag resulting therefrom, comprising:
directing a laser beam onto said workpiece to thereby melt metal therefrom and form magnetized slag by transforming the austinetic stainless steel to a martinsitic steel slag;
directing a gas stream toward the area of said workpiece which is thus being melted to thereby blow said slag away from said area along a path; and
collecting said slag on a magnet located on said path.

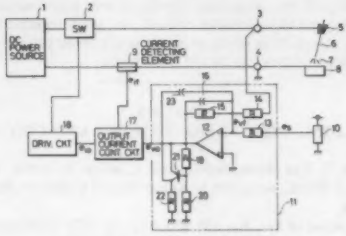
4,447,702

DC ARC WELDING APPARATUS HAVING VARIABLE CURRENT RESPONSE

Takaji Mizuno; Hiroshi Suwahara, and Hirohisa Segawa, all of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 12, 1982, Ser. No. 407,408
Claims priority, application Japan, Aug. 12, 1981, 56-126496
Int. Cl.³ B23K *9/10*
U.S. Cl. 219—130.33 **5 Claims**

1. A DC welding apparatus, comprising:
a DC power source for supplying current between a welding electrode and a material to be welded via a switching element;
means for comparing a feedback voltage detected across said welding electrode and said material to be welded with a predetermined voltage, to provide a difference signal;
circuit means having a plurality of delay elements selectively operated in response to an output signal of said comparing means;
current detecting means for detecting a current flowing between said welding electrode and said material to be welded;



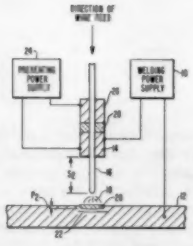
an output current control circuit for subjecting a current detected by said current detecting means and an output of said circuit means corresponding to a predetermined current to comparison to derive a control signal; and
driving means responsive to said control signal for driving said switching element.

4,447,703

METHOD AND APPARATUS FOR ARC WELDING

Israel Stol, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 13, 1981, Ser. No. 321,156
Int. Cl.³ B23K *9/10*
U.S. Cl. 219—136 **2 Claims**

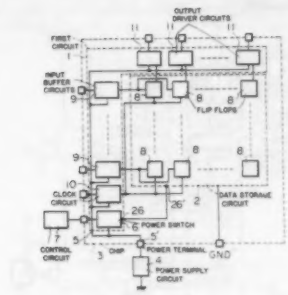


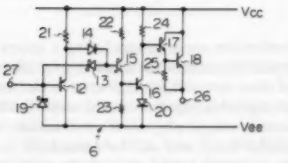
1. An apparatus for welding a metal workpiece comprising:
a first source of electric power connected between a first electrode contact tip and the workpiece;
a second source of electric power connected between said first electrode contact tip and a second electrode contact tip, wherein said first and second electrode contact tips are spaced apart by a fixed distance;
a consumable electrode slidably disposed between said electrode contact tips, wherein the preheat content of said consumable electrode is controlled by adjusting current flowing through a fixed length of said consumable electrode between said first and second contact tips; and
a dielectric element between said electrode contact tips, said dielectric element having an opening through which said consumable electrode passes to prevent lateral movement of said consumable electrode.

4,447,704
SEMICONDUCTOR DEVICE FOR DRIVING THERMAL PRINT HEADS

Hirokazu Suzuki, Yamato, and Takehiro Akiyama, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 18, 1983, Ser. No. 458,849
Claims priority, application Japan, Jan. 19, 1982, 57-006335
Int. Cl.³ H05B *3/00;* **G01D** *15/10;* **B41J** *3/20*
U.S. Cl. 219—216 **13 Claims**





1. A semiconductor device formed on a single semiconductor chip operatively connected to receive a power control signal, comprising:

a first circuit activated when power is applied to the semiconductor device, comprising:

input buffer circuits; and

output driver circuits, operatively connected to said input buffer circuits; and

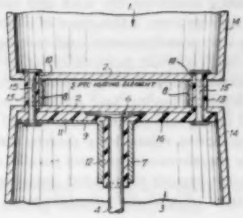
a second circuit, operatively connected to said first circuit, activated only when both power and the power control signal are applied to the semiconductor device, said second circuit comprising a data storing circuit operatively connected to said input buffer circuits and said output driver circuits.

4,447,705
HAIR CURLERS HAVING PTC ELECTRIC HEATING ELEMENT

James H. Bullock, Trumbull, Conn., assignor to Clairol Incorporated, New York, N.Y.

Filed Jun. 4, 1981, Ser. No. 270,434
Int. Cl.³ A45D *2/36;* **H05B** *1/00*
U.S. Cl. 219—222 **6 Claims**

1. An electrically heated hair curler comprising a generally cylindrical member about which hair may be wound and containing as a self regulating heater, a positive temperature coefficient thermistor, wherein said positive temperature coefficient thermistor is a flat disc having electrically and heat conducting cup shaped heat sinks on the opposite flat faces thereof, the outside bottoms of said heat sinks being in heat conducting and electrical contact with said thermistor and held tightly against said faces by electrically conductive connectors positioned through holes in the bottoms of said heat sinks and recesses in the outer circumference of said positive temperature coefficient thermistor, said connectors being electrically insulated from said thermistor and one of said cup-shaped heat sinks and electrically connected to the other of cup-shaped heat sinks; an electrical contact pin in electrical contact with the inside of the bottom of said one heat sink and held in place by a plastic insulator spacer; said insulator spacer having a sleeve in the center thereof around a portion of said pin which supports a ring electrical contact member and insulates it from said pin;

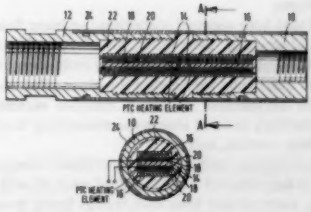


said ring electrical contact member having a leg extending radially outward from the portion thereof and resting on the insulator spacer so as to be insulated from said one heat sink, said leg having a hole therein through which one of the connectors extends and is in electrical contact therewith; the positive temperature coefficient thermistor being positioned so the center point of the flat faces thereof is concentric with the longitudinal axis of said curler, the sides of said heat sinks being imbedded in said cylindrical member to conduct heat thereto.

4,447,706
NOZZLE ASSEMBLY WITH INTEGRATED PTC HEATER FOR PREWARMING FUEL OIL

Werner Eder, and Gisbert Fischer, both of Dauchingen, Fed. Rep. of Germany, assignors to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 133,893, Mar. 25, 1980, abandoned. This application Aug. 30, 1982, Ser. No. 413,081
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1979, 2912000; Jul. 31, 1979, 2930996
Int. Cl.³ F23D *11/44;* **F02M** *31/12;* **H05B** *1/02, 3/14*
U.S. Cl. 219—299 **1 Claim**



1. In an oil burner system having a burner nozzle connected to a supply of fuel oil by a nozzle assembly incorporating a heater for prewarming the fuel fed to the nozzle, the improvement wherein said nozzle assembly comprises an elongated casing means having a first connector means at one end thereof directly connected to said nozzle and a second connector means at its other end directly connected to a conduit receiving oil from said supply of fuel, said preheater means comprising, an elongated rectangularly shaped PTC heating resistor in said casing means for the automatic controlled preheating of fuel oil received from said supply of fuel, said PTC resistor having a pair of parallel sides of greater width than the thickness of said resistor, coextensive electrical contact means extending longitudinally and transversely in electrical engage-

ment with said parallel sides, electric connecting means attached to said contact means for supplying electrical power thereto, heat transfer means in said casing means for transferring heat from said PTC resistor to oil flowing in said casing means, said heat transfer means including flattened parallel metal thin wall conduit sections extending between said first and second connectors and defining thin generally rectangular cross section flow paths for oil flowing through said casing means from said source of oil to said nozzle, said conduit sections extending coextensively with and sandwiching said PTC resistor therebetween, a thin layer of electrical insulation material being interposed between said resistor and said conduit sections, said conduit sections being in effective heat transmitting relation to said PTC resistor parallel sides with said conduit sections having said flattened surfaces thereof parallel to and facing said parallel sides of said resistor and in direct heat conductive relationship thereto through said thin insulation layer therebetween, and said parallel conduit section flow paths having smooth unimpeded cross sections to facilitate the flowing of oil uniformly therethrough.

4,447,707

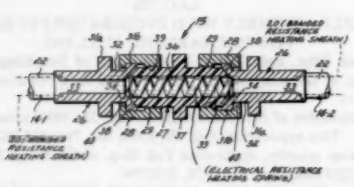
ELECTRICALLY HEATED MULTI-SECTION HOSE HAVING ELECTRICALLY HEATED HOSE JOINTS

Robert G. Baker, Buford, Ga., assignor to Nordson Corporation, Amherst, Ohio

Filed Dec. 22, 1981, Ser. No. 333,378

Int. Cl.³ H05B *5/62;* **F16L** *53/00;* **B67D** *5/62;* **H01R** *4/64*

U.S. Cl. 219—301 **18 Claims**



1. A multi-section hose heating system including a plurality of heated hose sections and a heated joint interconnecting those sections,

each of said hose sections comprising an inner fluid impervious, chemically inert tube, an electrically conductive multi-strand braided sheath snugly embracing the exterior of the inner tube for heating the inner tube, and an outer sheath of thermal insulating material surrounding the intermediate braided sheath for minimizing heat loss from the hose section, and

said heated joint comprising an electrically conductive hose end fitting secured to one end of each of said hose sections, each of said hose end fittings being in electrically conductive contact with the electrically conductive braided sheath of the hose section to which the hose end fitting is secured, an electrical insulating fitting sealingly secured between two hose end fittings, and an electrical resistance compression spring located within the interior of said electrical insulating fitting, said spring being in compression with the ends of said spring being in electrically conductive contact with said two hose end fittings, and

said spring having an electrical resistance such that the flow of electrical current through the spring from the braided sheath of one hose section to that of the other produces sufficient heat in the insulating fitting that the interior of said joint is maintained at approximately the same temperature as the interior of said heated hose sections.

4,447,708

ASSEMBLY FOR USE IN THE SPARK PERFORATION OF SHEET MATERIAL

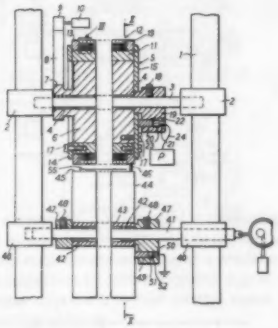
Roger A. Allen, Gt. Missenden, and Robert J. Hall, Flackwell Heath, Nr. High Wycombe, both of England, assignors to The Wiggins Teape Group Limited, England

Filed Jun. 30, 1981, Ser. No. 279,192

Claims priority, application United Kingdom, Jul. 9, 1980, 8022453

Int. Cl.³ H05B *7/18*

U.S. Cl. 219—384 **10 Claims**



1. Spark perforation apparatus including a rotary electrode assembly adapted for rotation about an axis for effecting spark perforation of sheet material passing between electrodes of the assembly and a suitably juxtapositioned earthed surface, said electrode assembly comprising a first set of annular electrodes which are annular about said axis for connection to a suitable power source, a second set of annular electrodes which are annular about said axis, individual ones of the first and second sets of electrodes alternating and being axially and radially spaced from one another along the axis, each one of the second set of electrodes having a greater external diameter than the electrodes of the first, and dielectric material which is annular about the axis and fills the axial spacing between adjacent ones of said first and second sets of electrodes to form a series of axially spaced capacitors.

4,447,709

METHOD FOR ELECTRICALLY PERFORATING DIELECTRIC WEBS

Hobart A. Whitman, III, Asheville, N.C., assignor to Olin Corporation, Pisgah Forest, N.C.

Continuation of Ser. No. 745,568, Nov. 29, 1976, abandoned, which is a division of Ser. No. 689,834, May 25, 1976, Pat. No. 4,025,752. This application Dec. 21, 1979, Ser. No. 106,369

Int. Cl.³ H05B *7/18*

U.S. Cl. 219—384 **3 Claims**

1. A method of controlling the porosity of a web of sheet material, by controlling a series of periodic electrical pulses applied to a set of electrodes, whereby a corresponding set of electrical discharges is directed through the web, the steps of said method comprising:

(a) moving the web of sheet material past the set of electrodes;

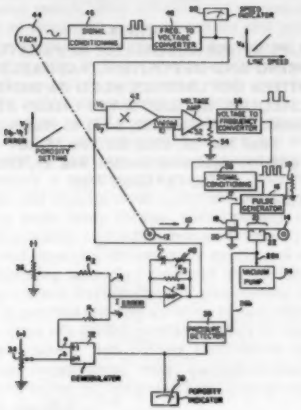
(b) measuring the web volocity;

(c) measuring the porosity of the web;

(d) deriving a difference signal as a function of the difference between a reference indicative of desired porosity and measured web porosity, the difference signal in normal operation being non-zero and having a magnitude directly related to desired porosity; and

(e) controllably generating and applying a series of the peri-

odic pulses to the set of electrodes in accordance with the product of the measured web velocity and the difference



signal, whereby the porosity of the web is effectively controlled.

4,447,710

ELECTRIC COOKERS INCORPORATING RADIANT HEATERS

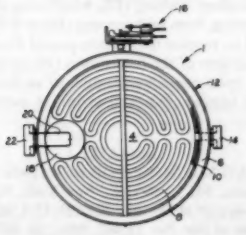
Joseph A. McWilliams, Hadzor, England, assignor to Micropore International Limited, Droitwich, England

Filed Aug. 6, 1982, Ser. No. 405,719

Claims priority, application United Kingdom, Aug. 8, 1982, 8124324

Int. Cl.³ H05B *3/68*

U.S. Cl. 219—449 **17 Claims**



1. A glass ceramic top cooker comprising:

a glass ceramic plate forming a cooking surface; and

at least one radiant electric heater arranged immediately beneath the plate and comprising a continuous base layer of electrical and thermal insulating material, a peripheral wall of electrical and thermal insulating material, a heating element arranged on the base layer, thermal insulating means disposed on the base layer within a region adjacent and bounded by the peripheral wall for thermally isolating a region within the peripheral wall from heat emitted by the heating element, and a temperature sensor mounted on said thermal insulating means within the isolated region so as to be in thermal contact with the underside of the plate whereby, in use, the temperature sensor is sensitive only to the temperature of said plate which is determined by the temperature of a cooking pan which is positioned on the plate and is heated by the heater.

4,447,711

ELECTRIC HEATER

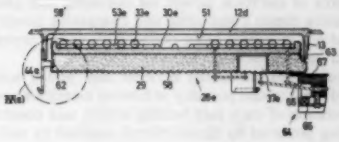
Karl Fischer, Am Gänsberg 23, D-7519 Oberderdingen, Fed. Rep. of Germany

Filed Dec. 23, 1981, Ser. No. 333,811

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1980, 3049521

Int. Cl.³ H05B *3/68*

U.S. Cl. 219—464 **20 Claims**



1. An electric hotplate, having an insulator bearing at least one electrical heating resistor, comprising:

a metal plate heatable by the at least one electrical heating resistor, having substantially flat upper and lower surfaces and a downwardly directed rim near its outer circumference, the rim and lower surface defining a space therebetween, and the upper surface forming a cooking surface for receiving cooking vessels placed thereon;

the insulator having a plurality of insulating layers, the at least one heating resistor being disposed on the upper surface of the uppermost layer;

a basket-shaped metal lattice surrounding the insulator about its outer surface and holding the plurality of insulating layers together, the insulator and metal lattice forming an indpendently positionable heater/insulator assembly; and

fastening means at the rim for engaging the metal lattice and holding the heater/insulator assembly in position at least partly in the space.

4,447,712

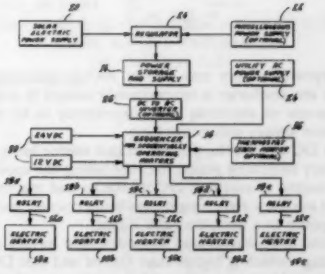
HEATING SYSTEM

Joseph E. Covillion, 3 Tumblebrook Rd., Terryville, Conn. 06786

Filed Feb. 24, 1982, Ser. No. 351,786

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—486 **14 Claims**



1. A system for space heating a dwelling, office and the like by direct current power generated by photovoltaic solar cells, the system comprising:

a plurality of electrically powered heating means for space heating, each said heating means being operable independently of the other heating means, each said heating means including an input, said heating means capable of being powered by direct current;

a chargeable power supply for storing power from said photovoltaic cells and for supplying power to said heating

system, the power supply comprising an input for receiving electrical power from said cells, an output for transmitting power to said heating means, a plurality of batteries for storing electrical energy, circuitry for connecting in parallel said plurality of batteries to said input to provide for charging of said batteries, circuitry for connecting in series said plurality of batteries to said output to provide power to said heating means, and means responsive to a signal for switching between said parallel circuitry and said series circuitry;

a source of electrical power for operating said plurality of heating means comprising said chargeable power supply, said power source being connectable to said input of each said heating means;

control means connected between said power source and said input of said plurality of heating means for controlling operation of each said heating means, said control means being powered by direct current supplied by said chargeable power supply;

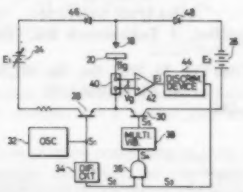
said control means including for each said heating means a normally open switch means for connecting and disconnecting its respective heating means to said power source;

said control means further including means for generating a signal for closing each said switch means for a time interval to power its respective heating means, said generating means signaling in a sequence said plurality of switch means to close only one said switch means at a time to thereby power its respective heating means.

4,447,713
POWER SUPPLY UNIT FOR ELECTRIC DISCHARGE MACHINE

Kazuo Tsurumoto, and Yoshio Ozaki, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 4, 1982, Ser. No. 345,847
Claims priority, application Japan, Feb. 13, 1981, 56-19727
Int. Cl.³ B23P 1/08
U.S. Cl. 219—69 G **8 Claims**



1. A power supply unit for an electric discharge device wherein arc discharge is intermittently caused in a machining gap between an electrode and a workpiece to be machined, said power supply unit comprising:

a first DC source, the voltage of said source being variable;

auxiliary switching means for controlling the application of an output of said first DC source to said machining gap, said auxiliary switching means being opened and closed in response to a periodic pulse signal;

a second DC source, said second source having an output voltage which is higher than that of said first DC source;

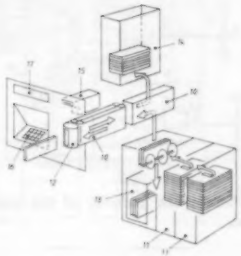
main switching means for applying an output of said second DC source to said machining gap for a constant duration when activated, said main switching circuit being activated by a discriminating signal and including a semiconductor switch element and having a peak current supply capacity larger than that of said auxiliary switching means; and

a discriminating device for detecting the electrical condition of said machining gap a predetermined period of time after said output voltage of said first DC source is applied to said machining gap, said discriminating device discriminating between short circuit, normal discharge and non-discharge states and providing said discriminating signal only if a discharge is occurring after said predetermined time has passed.

4,447,714
DUAL-PURPOSE AUTOMATIC APPARATUS FOR DISPENSING AND DEPOSITING VALUABLE PAPERS AND OTHER DOCUMENTS, SUCH AS BANKNOTES, CHEQUES, RECEIPTS, VOUCHERS ETC.

Leif Lundblad, Häradsvägen 102, S-141 41 Huddinge, Sweden

Filed May 25, 1982, Ser. No. 381,657
Claims priority, application Sweden, Jun. 29, 1981, 8104036
Int. Cl.³ G06K 7/08
U.S. Cl. 235—379 **6 Claims**



1. A dual-purpose automatic apparatus for dispensing and depositing, valuable papers and other documents, such as banknotes, cheques, receipts, vouchers etc, comprising a feed means (**10**) for dispensing documents from an internal store (magazines **11**) to an outfeed opening (**12**), or to a storage space (**13**) which is intended to receive documents whose transportation from said store to said outfeed opening (**12**), or whose treatment during said transportation, has deviated from a predetermined program for some reason, characterized in that the feed means **10** is arranged also to feed documents posted through the outfeed opening (**12**), which thus also functions as an infeed opening, from said opening (**12**) to a storage chamber (**14**) intended to receive documents posted from without; and in that the function of the feed means (**10**) as an infeed means is dependent upon correct activation of an identifying means (**15**) arranged adjacent the outfeed/infeed means (**10**).

4,447,715
SORTING MACHINE FOR SORTING COVERS

Vincent Vulcano, 301 E. 48th St., New York, N.Y. 10017

Continuation-in-part of Ser. No. 202,124, Oct. 30, 1980, which is a continuation of Ser. No. 21,467, Mar. 19, 1979, abandoned. This application Nov. 20, 1981, Ser. No. 323,295
Int. Cl.³ G06K 7/10, 7/14
U.S. Cl. 235—454 **12 Claims**

1. A sorting machine for sorting sheets of different optical indicia, comprising:

transport means for moving said sheets in a path;

means for converting optically responsive indicia on said sheets to an electrical analog signal with said sheets moving along said path; said means for converting optically responsive indicia being comprised of an optical scanner having an elongated window whereby said optical scanner is responsive to a portion of said sheet, said means for converting optically responsive indicia further comprising an analog card for processing said electrical signal whereby said analog signal is enhanced;

computer means operably connected to said optical converting means for converting said analog signal to a digital signal, and for storing and comparing said digital signals, and having a training mode and an operating mode wherein said training mode comprises;

a training sheet being formed with optically responsive encoding indicia, said indicia being converted to a digital signal and stored by said computer means; and said means for converting optically responsive indicia further comprising a sensor having a pair of photodiodes whereby a two line punched code on a portion of said training cover is converted to a pair of electrical signals for input to said computer means, said pair of photodiodes feeding an electrical output signal from each photodiode to said computer means for comparison whereby an edge of said sheet is detected;

wherein said operating mode comprises sheets having common optical indicia as said training sheet, said latter said sheets being moved along said path information and digital signal generated relative thereto and compared with the stored training mode digital information, and when a comparison is found, said operating mode sheets are thereby detected, said transport means comprising a shaft angle encoder which feeds a series of pulses to said computer means whereby the speed of said sheet movement is measured.

4,447,716

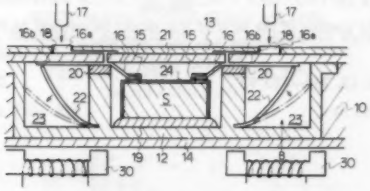
INFORMATION CARD

Seiichiro Aigo, 3-15-13, Negishi, Daito-ku, Tokyo, Japan

Filed Mar. 1, 1982, Ser. No. 353,252

Int. Cl.³ G06K *19/06*

U.S. Cl. 235—492 **10 Claims**



1. In an information card having an opening, and including a metallic casing disposed in the opening, at least one semiconductor chip having contacts and seated in the metallic casing, and a conductor strip extending from each of the contacts to a location where each strip can be brought into contact with a signal input/output terminal of a separate signal input/output unit, the improvement comprising the metallic casing having a cavity, an elastic member provided in said cavity at a location corresponding to each conductor strip and fixedly secured to the metallic casing at one end thereof, and a free end of each elastic member being biased into contact with its corresponding conductor strip while the information card is unused and said elastic member being attracted by a magnet in the signal input/output unit to cause its free end to separate from its corresponding conductor strip once the information card is used, each elastic member being made of magnetic material throughout its length.

4,447,717

AUTOMATIC FOCUSING DEVICE IN A STEREOSCOPIC MICROSCOPE

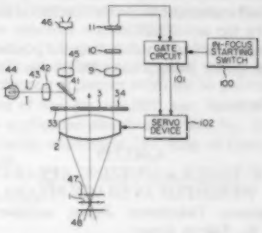
Masao Nohda, Yokosuka, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 29, 1982, Ser. No. 343,986

Claims priority, application Japan, Mar. 27, 1981, 56-44121

Int. Cl.³ G02B *7/11*

U.S. Cl. 250—201 **9 Claims**



1. An automatic focusing device for a stereoscopic microscope having a pair of left and right stereoscopic observation optical systems disposed rearwardly of a common objective lens, said automatic focusing device including:

automatic focusing means having optical means disposed rearwardly of the objective lens and out of the optical path of each of said stereoscopic observation systems to form together with the objective lens an optical path for focus detection, the automatic focusing means producing an electric signal corresponding to focus deviation and based on an optical image formed by said optical means and the objective lens and controlling automatically the stereoscopic microscope to an in-focus position thereof based on the electric signal, and

means for selecting operation and non-operation of said automatic focusing means.

4,447,718

APPARATUS FOR COLLECTING AND CONCENTRATING SOLAR LIGHT ENERGY

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

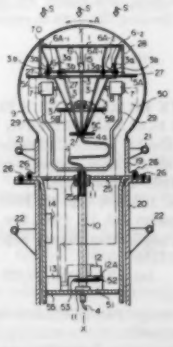
Filed Jun. 29, 1981, Ser. No. 278,202

Claims priority, application Japan, Jul. 7, 1980, 55-92468; May 6, 1981, 56-66942

The portion of the term of this patent subsequent to Jul. 20, 1999, has been disclaimed.

Int. Cl.³ G01J *1/20*

U.S. Cl. 250—203 R **15 Claims**



1. An apparatus for collecting and concentrating solar light

energy comprising; a transparent container; lens means for collecting and concentrating solar light energy; first supporting means for supporting the lens means so as to rotate the lens means about a horizontal axis; second supporting means for supporting the first supporting means so as to rotate the latter about a vertical axis; optical fiber means located at the focus of the lens means and extending to the outside of the container to transmit the collected sunbeams to the outside of the container; first drive means for rotating the lens means about the vertical axis; second drive means for rotating the lens means about a horizontal axis, independently of the drive of the first drive means; solar cell means connected to the first and second drive means to drive the same; and, means movable with and supported by the lens means, for detecting the position of the sun, said detecting means being connected to the drive means to control the driving of the drive means, in accordance with the position of the sun.

4,447,719

AUTOMATIC FOCUS ADJUSTING APPARATUS USING WEIGHTED AVERAGE MEANS

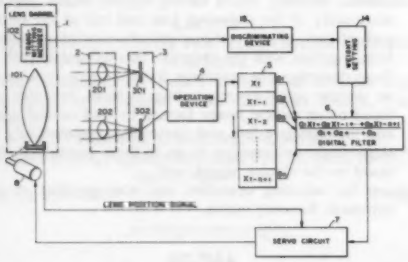
Akira Ogasawara, Yokohama, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Jan. 26, 1982, Ser. No. 342,776

Claims priority, application Japan, Feb. 3, 1981, 56-13748

Int. Cl.³ G03B *3/10*

U.S. Cl. 250—204 **11 Claims**



1. In an automatic focus adjusting apparatus for forming the image of an object by an imaging optical system on a predetermined imaging plane, said apparatus having detecting means for detecting the positional relation between the image of said object and said imaging plane from the output of a light receiving element array and successively producing detection signals indicative of said relation with lapse of time, the improvement comprising: means capable of storing a predetermined number of said detection signals, averaging means for averaging said predetermined number of detection signals and creating an adjusted control signal; and means for driving said imaging optical system for focuing the same in response to said adjusted control signal.

4,447,720

SOLID-STATE IMAGE PICKUP ELEMENT AND PROCESS FOR FABRICATING THE SAME

Kazufumi Ogawa, Osaka; Takao Chikamura, Kyoto, and Takuo Shibata, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Tokyo, Japan

Division of Ser. No. 188,580, Sep. 18, 1980, Pat. No. 4,345,021. This application Jul. 15, 1982, Ser. No. 398,569

Claims priority, application Japan, Sep. 25, 1979, 54-12334; Sep. 25, 1979, 54-12335

Int. Cl.³ H01L *31/08*

U.S. Cl. 250—211 J **3 Claims**

1. A solid-state image pickup element comprising:

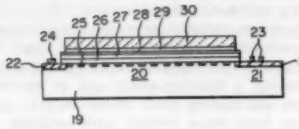
a semiconductor wafer;

a picture element portion formed over a main surface of said semiconductor wafer for sensing a light image and transferring the electric signals representative of the intensities of the light image at the picture elements;

a driving circuit for driving said picture element portion;

a photoconductive layer formed over said picture element portion;

an electrode transparent to visible light formed over said photoconductive layer;



a layer of a photosetting resin transparent to visible light formed on said transparent electrode; and a color filter bonded to said photosetting resin with an adhesive agent having optical properties substantially similar to or the same as the optical properties of the photosetting resin.

4,447,721

PANEL TYPE X-RAY IMAGE INTENSIFIER TUBE AND RADIOGRAPHIC CAMERA SYSTEM

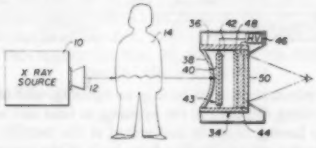
Shih-Ping Wang, Los Altos, Calif., assignor to Diagnostic Information, Inc., Sunnyvale, Calif.

Division of Ser. No. 71,701, Aug. 31, 1979, Pat. No. 4,300,046, which is a division of Ser. No. 923,719, Jul. 12, 1978, Pat. No. 4,186,302, which is a division of Ser. No. 853,440, Nov. 21, 1977, Pat. No. 4,140,900, which is a continuation-in-part of Ser. No. 763,637, Jan. 28, 1977, abandoned, and Ser. No. 741,430, Nov. 12, 1976, abandoned. This application Jul. 31, 1981, Ser. No. 288,804

The portion of the term of this patent subsequent to Feb. 20, 1996, has been disclaimed.

Int. Cl.³ H01J *31/50*

U.S. Cl. 250—213 VT **2 Claims**



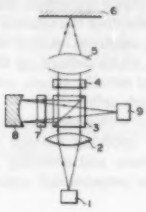
1. An X-ray sensitive image intensifier tube comprising a tube envelope, a metallic input window in the tube envelope, the input window being made of an alloy of iron, chromium and nickel, a scintillator screen adjacent the input window, a photocathode layer parallel and immediately adjacent to the scintillator screen, a phosphor display screen parallel to and spaced apart from the photocathode layer, and means for connecting an external source of high voltage between the photocathode layer and the output display screen, and wherein the tube envelope houses the scintillator screen, photocathode layer and display screen.

4,447,722

OPTICAL INFORMATION READING DEVICE

Tetsuo Saimi, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 15, 1981, Ser. No. 311,901
Claims priority, application Japan, Oct. 17, 1980, 55-146166
Int. Cl.³ H01J 40/14
U.S. Cl. 250—216 4 Claims



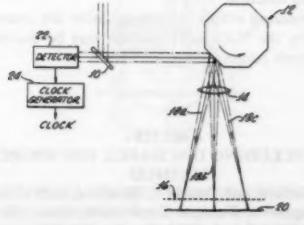
1. An optical information reading device comprising: a light beam source for producing a light beam which irradiates a recording surface of an information carrier; a light beam detector for detecting the light beam reflected from the recording surface of said information carrier; a lens system for converting the light beam from said light beam source into a collimated light beam parallel to the recording surface of said information carrier; a beam splitter adapted to reflect the light beam from said light beam source in a direction perpendicular to the recording surface of said information carrier but to allow the light reflected from the recording surface of said information carrier to pass therethrough; an objective lens system for converging the light beam reflected from said beam splitter on said recording surface of said information carrier; and means for reflecting toward said beam splitter at least a part of the light beam reflected from said recording surface of said information carrier and passed through said objective lens system and said beam splitter, and for focussing the thus obtained light beam on said detector through said beam splitter which reflects said thus obtained light beam at a right angle.

4,447,723

SCANNING BEAM REFERENCE EMPLOYING A RETROREFLECTIVE CODE MEANS

Don B. Neumann, Laguna Beach, Calif., assignor to Excellon Industries, Torrance, Calif.

Filed Sep. 3, 1981, Ser. No. 298,907
Int. Cl.³ H01J 3/14
U.S. Cl. 250—236 18 Claims



1. In a scanning system wherein an energy beam is projected in a fan shaped scanning pattern and an outgoing reference beam is projected in synchronism with the energy beam in a fan shaped scanning pattern through a reference code member to impinge thereon with varying angles of incidence in the plane of the scanning pattern, an improved reference beam detecting system comprising

a retroreflector positioned to receive said reference beam from said code member at varying incident angles and direct the beam back through the code member along the direction of incidence, and

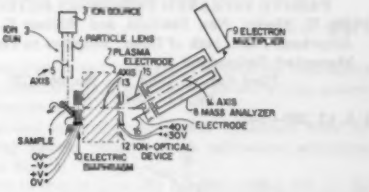
means for detecting said retroreflected reference beam after it has been reflected back through the code member.

4,447,724

APPARATUS FOR THE CHEMICAL ANALYSIS OF SAMPLES

Hans Oechsner, Clausthal-Zellerfeld, Fed. Rep. of Germany, assignor to Leybold Heraeus GmbH, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 139,087, Apr. 10, 1980, abandoned.
This application Jan. 7, 1982, Ser. No. 337,647
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1979, 2950330
Int. Cl.³ H01J 49/26, 49/10
U.S. Cl. 250—309 10 Claims



1. Apparatus for the chemical analysis of a sample, comprising:

primary ion source means (3) bombarding the sample (1) with ions along an axis (5) for ejecting neutral and charged particles from the sample;

electric diaphragm means (10) for being permeable along an axis (13) to the neutral particles ejected from the sample and impermeable at least to the charged particles ejected from the sample;

plasma means (7) separate from the primary ion source means (3) and having a plasma along the axis (13) along which the electric diaphragm means (10) is permeable to the neutral particles and receiving the same therealong for ionizing the neutral particles with the plasma; and

mass spectrometer means (8, 9) further along the axis (13) along which the electric diaphragm means is permeable than the plasma of the plasma means (7) to receive the now-ionized, formerly-neutral particles therefrom for performing the chemical analysis of the sample from the received ionized, formerly-neutral neutral particles thereof.

4,447,725

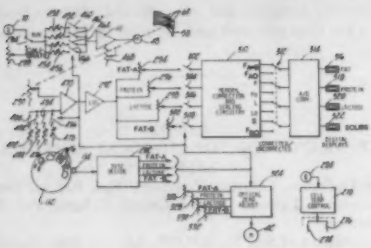
QUANTITATIVE MEASUREMENT OF FAT, PROTEIN AND LACTOSE IN DAIRY PRODUCTS

Delmar A. Biggs, R.R. #3, Guelph, Ontario, Canada (N1H 6H9), and John Shields, 23 North La., Wheldrake Nr. York, England

Filed Jun. 15, 1981, Ser. No. 273,392
Int. Cl.³ G01J 1/00
U.S. Cl. 250—339 7 Claims

1. Apparatus for measuring fat concentration in fat emulsions such as natural and synthetic dairy products comprising means for holding a product sample, means for irradiating said sample with energy in the infrared spectrum at a first wavelength characteristic of ester linkages and a second wavelength

characteristic of saturated carbon-hydrogen bonds, and means for assessing fat concentration in the sample as a predetermined



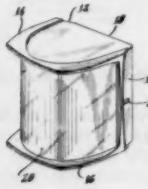
conjoint function of energy absorbed by said sample at both said first and second wavelengths.

4,447,726

PASSIVE INFRARED INTRUSION DETECTOR

Philip H. Mudge, New Fairfield, and William G. Kahl, Jr., Arrowhead Point, both of Conn., assignors to Cerberus AG, Mannedorf, Switzerland

Filed Apr. 16, 1982, Ser. No. 369,228
Int. Cl.³ G01J 1/00
U.S. Cl. 250—342 **15 Claims**



1. An intrusion detector comprising:
a housing having an opening therein;
an infrared transparent window closing said opening;
a chassis mounted in said housing for rotation about a first axis;
an infrared sensor carried by said chassis;
a visible light source carried by said chassis;
a truncated, substantially conical enclosure mounted in said chassis and pivoted about a second axis substantially normal to said first axis, the open small end of said enclosure surrounding said sensor and light source, the open large end of said enclosure being adjacent said window;
a flexible Fresnel lens supported over the open large end of said enclosure with its focal point positioned substantially on one of said sensor and source; and
mirror means positionable between said sensor and source such that said sensor and source are at conjugate points on opposite sides of said mirror.

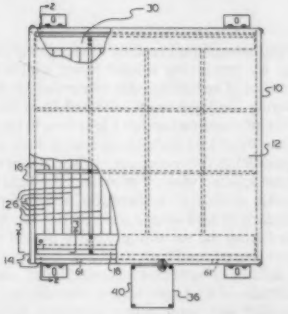
4,447,727

LARGE AREA NEUTRON PROPORTIONAL COUNTER AND PORTAL MONITOR DETECTOR

Stanley J. Friesenhahn, Poway, Calif., assignor to IRT Corporation, San Diego, Calif.

Filed Jun. 30, 1981, Ser. No. 278,958
Int. Cl.³ G01T 1/18, 3/00
U.S. Cl. 250—390 **29 Claims**

1. A large area unitary multicell neutron counter comprising:
a container for defining an internal space and for confining counting gas therein, said container being formed of a pair of spaced substantially parallel metallic sheets sealed around their periphery and coated internally with a coating enriched with ^6Li for capturing slow neutrons and emitting into said internal space reaction products thereupon produced by the $^6Li(n,\alpha)^3H$ reaction;
a plurality of wires mounted within said internal space, spaced apart from each other and said metallic sheets and substantially parallel to each other and between and substantially parallel to said metallic sheets and electrically insulated from said metallic sheets;
a gas permeable dividing structure disposed within said internal space for dividing the internal space into discrete cells and absorbing electrons incident upon such structure, each cell having a width defined by the spacing between the coatings on said metallic sheets, with at least one wire passing through each cell;
counting gas disposed within said container;
electrical means for applying voltage to enable the said metallic sheets, wires, and counting gas to function at rated voltage in the proportional region in the collection



of charged particles occasioned by ionizing events, the wires being anodes and the metallic sheets being cathodes, and the counting gas providing a medium in which the ionizing events occur; and
discriminating means for discriminating ionizing events causing ionization above a discrimination level from ionizing events causing ionization below said discrimination level;
the linear dimensions of each cell being so small that a reaction product from said $^6L(n,\alpha)^3H$ reaction will with substantial probability stop in the counting gas whereas the energy deposition in the counting gas from a single electron resulting from a photon entering a cell will nearly always be small compared with the energy deposition from said reaction;
whereby ionizing events occurring within the counting gas caused by the $^6Li(n,\alpha)^3H$ reaction may be discriminated from events causing lesser ionization.

4,447,728

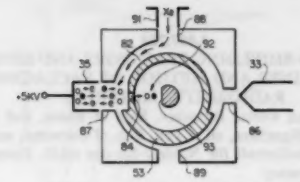
IONIZER INCLUDING DISCHARGE ION SOURCE AND METHOD

George C. Stafford, and Donald C. Bradford, both of San Jose, Calif., assignors to Finnigan Corporation, Sunnyvale, Calif.

Filed Feb. 5, 1982, Ser. No. 346,288
Int. Cl.³ H01J 27/02
U.S. Cl. 250—423 R **6 Claims**

1. An ionizer including a chamber having an opening extending into said chamber, a discharge electrode disposed adjacent said opening in cooperative relationship with said chamber, means for introducing discharge gas to said discharge electrode, means for establishing a discharge voltage between said chamber and said discharge electrode to form a gas discharge

which forms charged gas particles, said discharge voltage serving to accelerate the charged particles toward said opening



to cause charged and uncharged particles to pass through said opening into said chamber.

4,447,729

TRANSPORT CONTAINERS FOR RADIOACTIVE MATERIAL

Pal Dorosziai, Kirchdorf, and Ferruccio Ferroni, Zurich, both of Switzerland, assignors to Elektrowatt Ingenieurunternehmung AG., Switzerland

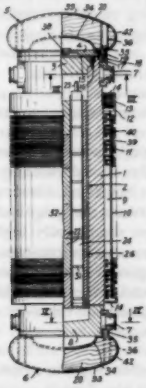
PCT No. PCT/CH80/00093, 371 Date Apr. 20, 1981, 102(e) Date Apr. 20, 1981, PCT Pub. No. WO81/00642, PCT Pub. Date Mar. 5, 1981

PCT Filed Aug. 1, 1980, Ser. No. 253,751

Claims priority, application Switzerland, Aug. 20, 1979, 7593/79

Int. Cl.³ G21F *5/00*

U.S. Cl. 250—506.1 **9 Claims**



1. A cylindrical container for the transportation of radioactive reactor elements, said container including a top end, a bottom end and a pair of removable outwardly curved shock absorbers each including a double-shelled construction having an internal shell and an external shell with a convex extrados configuration, said shock absorbers being filled with low density energy-absorbing material and mounted at said top end and said bottom end of the container, respectively, and each of said shock absorbers having a toroidal configuration, and deformable tubes disposed therein and extending in the axial direction of said container.

4,447,730

TRANSPORTATION AND/OR STORAGE CONTAINERS FOR RADIOACTIVE MATERIALS

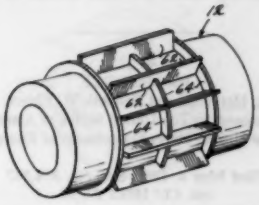
Werner Botzem, Alzenau; Ortwin Knappe, and Reiner Laug, both of Hanau, all of Fed. Rep. of Germany, assignors to Transnuklear GmbH, Hanau, Fed. Rep. of Germany

Filed Jul. 10, 1981, Ser. No. 282,014

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1980, 8018594[U]

Int. Cl.³ G21F *5/00*

U.S. Cl. 250—506.1 **7 Claims**



1. A transportation and/or storage container for radioactive substances, especially for irradiated fuel elements from nuclear reactors comprising:

a thick-walled integrally-cast metallic cylindrical body for shielding gamma radiation from radioactive substances carried therein;

a plurality of spaced generally parallel cooling ribs on the outer cylindrical surface of said body and extending radially outward thereof; and

a plurality of generally parallel flanges on said outer surface extending radially outward thereof and generally transversely of and to and between said ribs, said flanges being spaced along said ribs and of lesser height than said ribs, whereby in the event of accidental fracture or breaking of a rib, the fracture line occurs above the rib base to prevent continuation of a fracture into said body of the container.

4,447,731

EXTERIOR VIEW EXAMINATION APPARATUS

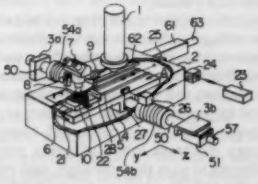
Asahiro Kuni, Tokyo; Yukio Kembo, Yokohama; Nobuyuki Akiyama, Yokohama, and Nobuhiko Aoki, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 3, 1981, Ser. No. 327,191

Claims priority, application Japan, Dec. 5, 1980, 55-170999

Int. Cl.³ H01J *37/20*

U.S. Cl. 250—442.1 **7 Claims**



1. An exterior view examination apparatus comprising:

a movable sample stage provided in a sample chamber of a scanning type electron microscope;

a sample mounted on said sample stage; and

an optical microscope for observing said sample from an exterior of said sample chamber, said optical microscope being mounted on said chamber parallel with said scanning type electron microscope, the postion of a surface

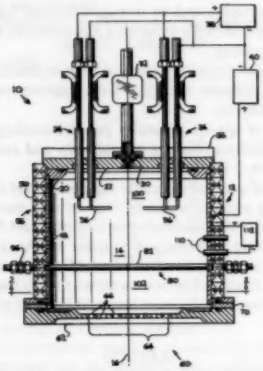
part of said sample to be observed, measured, or analyzed being preliminarily defined by said optical microscope, said sample stage being moved by a certain amount to thereby bring said sample at a center of the visual field of said electron microscope and wherein said movable sample state comprises a first movable stage supported outside of said sample chamber to slidably move in a first direction by a first driving means provided outside of said sample chamber, and a second movable stage disposed on said first movable stage to slidably move between said optical microscope and said electron microscope in a second direction perpendicular to said first direction by a second driving means provided outside of said sample chamber.

4,447,732

ION SOURCE

Ka-Ngo Leung, Hercules, and Kenneth W. Ehlers, Alamo, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 4, 1982, Ser. No. 374,847
Int. Cl.³ H01J 27/20
U.S. Cl. 250—427 9 Claims



1. An ion source for ionizing neutral hydrogen molecules and atoms into positive ions for neutral beam injection in a fusion energy system comprising:

a vessel having a chamber formed therein;

means coupled to the chamber for emitting high-energy ionizing electrons which collide with said hydrogen molecules and atoms to form a plasma of positive ions, said chamber being maintained at a positive potential with respect to said plasma;

extractor means coupled to the chamber to be biased at a low negative voltage with respect to said plasma for extracting said positive ions from the chamber, said low voltage being insufficient to cause said ions to heat and sputter said extractor means and insufficient to cause arcing between said extractor means and said chamber; and

filtering means extending across said chamber reflecting high-energy electrons while allowing positive ions and cold electrons to pass therethrough, said reflecting means dividing the chamber into an ionizing zone, which communicates with the means for emitting high-energy ionizing electrons and which contains ions and high-energy electrons, and into an extraction zone, which contains positive ions and relatively few high-energy electrons so that undesired species of ions are prevented from being formed in the extraction zone due to the relative absence of high-energy electrons required for formation of said undesired ions;

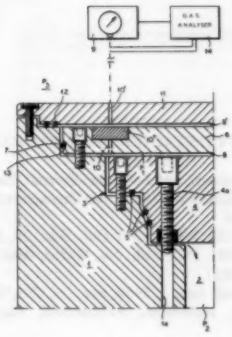
said filtering means including a means for providing a magnetic field transverse to the direction of ions travelling from the ionizing zone to the extraction zone.

4,447,733

RADIATION-SHIELDING TRANSPORT AND STORAGE CONTAINER AND METHOD OF PACKAGING RADIOACTIVE MATERIAL

Heaning Baatz; Dieter Rittscher, both of Essen, and Jürgen Wriegt, Heiligenhaus, all of Fed. Rep. of Germany, assignors to GNS Gesellschaft für Nuklear-Service mbH, Essen, Fed. Rep. of Germany

Filed Jul. 1, 1981, Ser. No. 279,332
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1980, 3025795
Int. Cl.³ G21F 5/00
U.S. Cl. 250—506.1 7 Claims



1. A radiation-shielding transport and storage container for radioactive material, said container comprising:

a radiation shielding vessel composed of cast iron or cast steel and defining a storage chamber for said radioactive material and a mouth opening into said chamber and formed with a plurality of seats;

a plug-type radiation-shielding cover received in one of said seats and sealed with respect to said vessel by an inner seal;

a safety cover speced outwardly from said shielding cover, received in another of said seats and sealed with respect to said vessel by an outer seal whereby said covers define a control space between said inner and outer seal containing gas at a pressure significantly higher than that in said chamber and than atmospheric pressure; and

pressure-monitoring means communicating with said space and responsive to a drop in the pressure therein below a predetermined threshold value for signaling a failure of one of said seals.

4,447,734

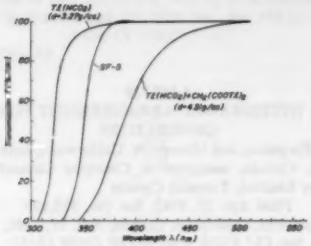
RADIATION-SHIELDING TRANSPARENT MATERIAL AND METHOD OF PRODUCING THE SAME

Asao Kusumegi, Tsuchiura; Kenjiro Kondo, Niihari; Yoshiyuki Watase, Niihari; Yoshio Yoshimura, Niihari, and Kozo Miyake, Kyoto, all of Japan, assignors to National Laboratory for High Energy Physics, Ibaragi, Japan

Filed Sep. 23, 1981, Ser. No. 304,885
Claims priority, application Japan, Nov. 13, 1980, 55-158800
Int. Cl.³ G21F 1/00
U.S. Cl. 250—517.1 10 Claims

1. Radiation-shielding transparent material consisting of an

aqueous solution of deoxidized thallium formate dissolved in deoxidized distilled water, said material having a density of 2.5



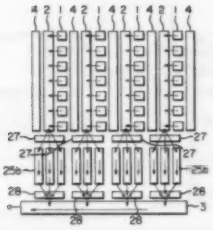
to 3.3 g/cm^3, a radiation length of 3.8 to 1.9 cm, and a transmission of not less than 93% for light of 400 nm wavelength.

4,447,735

CHARGE-COUPLED TYPE SOLID-STATE IMAGE SENSOR

Kenju Horii, Shiga, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 17, 1981, Ser. No. 331,686
Claims priority, application Japan, Dec. 19, 1980, 55-180726
Int. Cl.^{3} H01L *27/10*
U.S. Cl. 250—578 **2 Claims**



1. A charge-coupled type solid-state image sensor, comprising a semiconductor substrate having formed thereon:

an image pickup region comprising photosensor element arrays and charge transfer arrays coupled thereto for generating and accumulating signal charge in response to a light image impinging on said photosensor element arrays;

a plurality of charge storage regions each comprising at least two parallel-connected charge storage arrays;

first transfer switching gate means interposed between said charge transfer arrays and said charge storage region for coupling charge from each charge transfer array to a corresponding one of each of said charge storage arrays so that said signal charge is sequentially transferred into the charge storage arrays of each said corresponding charge storage region, i.e. into one array of each corresponding charge storage region at a time;

a readout region; and

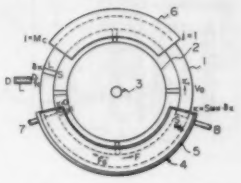
second transfer switching gate means coupled between said charge storage regions and said readout region for sequentially transferring signal charge from each array of a corresponding charge storage region to said readout region in a first-in-first-out manner, so that signal charge is read out from one charge storage array of each corresponding charge storage region while signal charge remains in at least one other charge storage array of said corresponding charge storage region.

4,447,736

NON SELF-STARTING THERMAL MAGNETIC ENERGY RECYCLING FERRITE RING ENGINE

Aisuke Katayama, 2-47, Mutsumimachi, Kawamoto, Akita-shi, Akita, Japan

Filed Sep. 1, 1982, Ser. No. 413,706
Claims priority, application Japan, Sep. 2, 1981, 56-137054
Int. Cl.^{3} H02N *10/00*
U.S. Cl. 290—1 R **2 Claims**



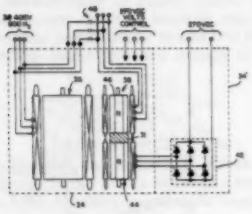
1. A magnetic energy recycling scheme which is a combination of first means for generating a mechanical power by magnetic energy recycling, and second means for starting the first means and keeping the first means in a stable power generatng state; the first means comprising one or plurality of thin circular rings of ferrite having the Curie temperature T_Q, a nonmagnetic plate to which said ferrite rings are affixed concentrically, providing a shaft to link with said second means, a hot water reservoir in which hot water must flow with a high flow rate, appropriate pressure head, and average temperature T_H such that said hot water heat power flow being transferred to said ferrite rings surface layer raises said surface layer temperature rapidly near to T_Q, a cool water reservoir wherein cool water flowing having the same properties except average temperature T_C lower than T_Q is extracted heat power from said ferrite rings surface layer and restored said ferrite rings surface layer to be magnetizable, and a magnetic field generator located outside of said hot water reservoir providing a constant magnetic field H to the portion of said ferrite rings located in said hot water reservoir; and the second means comprising a starter motor connected through a clutch and gear trains to said shaft of said first means that lacks the function of self-starting, starting to rotate said ferrite rings through said hot and cool water reservoirs cyclically, generating a positive and negative temperature gradients in the temperature range less and near T_Q in the surface layer of said ferrite rings, and then a consequent force being exerted on the part of said ferrite ring dipping in said hot water reservoir by said magnetic field H, and an electric power generator connected through gear trains to said shaft, soon beginning to generate a counter torque that balances the torque due to said force exerted in said first means, then keeping said circular ferrite rings in a constant peripheral velocity V_0, and holding a stationary positive and negative gradients of temperature along said circular ferrite rings surface layer, henceforth, said first means being entered in the magnetic recycling state, a continuous magnetic potential energy being generated in said rotating ferrite rings surface layer at the entrance portion of said hot water reservoir from said magnetic field H also applied there by said magnetic field generator, and converting promptly into a mechanical power within the average time t_H as said magnetic energy being lost by a fast temperature rise to near T_Q concerning to said ferrite rings surface layer, spatially said mechanical power being generated in the succeeding ferrite rings part dipping in said hot water; and further a controller governing said operations aforementioned.

4,447,737

VARIABLE FREQUENCY INDUCTION GENERATOR

Michael J. Cronin, Sherman Oaks, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Continuation of Ser. No. 220,371, Dec. 29, 1980, abandoned.
This application Jan. 14, 1983, Ser. No. 457,836
Int. Cl.[3] H02K *21/48*
U.S. Cl. 290—6 32 Claims



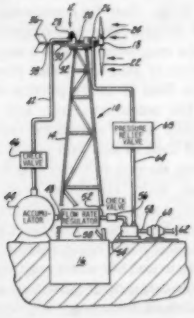
1. A power generation system comprising in combination:
an induction machine, said induction machine including an induction rotor mounted on a first shaft; and
means connected to said induction machine for exciting said induction machine to operate in a generating mode, said exciting means comprises a tandem synchronous generator including first and second synchronous permanent magnet generators, each said first and second synchronous permanent magnet generators having a permanent magnet rotor mounted on a second shaft.

4,447,738

WIND POWER ELECTRICAL GENERATOR SYSTEM

Johnny H. Allison, 43040 Penny, Sterling Heights, Mich. 48078

Filed Dec. 30, 1981, Ser. No. 335,983
Int. Cl.[3] F03D *9/02*
U.S. Cl. 290—44 17 Claims



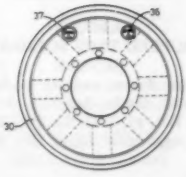
1. A wind power electrical generator system comprising:
means for converting wind energy into rotational energy of an output shaft;
first air compressor means driven by said output shaft for generating a supply of compressed air;
accumulator means connected to said first air compressor means for storing said compressed air;
electrical generator means for generating electrical power in response to a rotary input;
first air motor means having an input port and an exhaust port, for generating said rotary input to said electrical generator in response to a flow of pressurized air received at said input port from said accumulator means; and
first waste air recovery means connected to said exhaust port of said first air motor means for converting the waste air flow exhausted by said first air motor means into a rotational energy supplementing said means for converting wind energy in driving said first air compressor means.

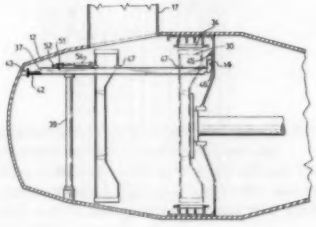
4,447,739

ROTOR WITHDRAWAL ARRANGEMENT FOR BULB GENERATORS

James H. Ferguson, and Murray W. Calderwood, both of Peterborough, Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Filed Apr. 27, 1982, Ser. No. 372,126
Claims priority, application Canada, Jun. 19, 1981, 380253
Int. Cl.[3] F03B *3/10, 11/10;* G03B *13/10*
U.S. Cl. 290—52 6 Claims



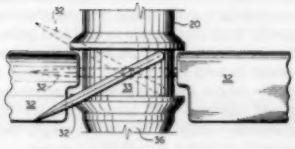


1. Rotor withdrawal apparatus for a bulb-type generator, comprising
a bulb-shaped housing adapted for mounting within a water conducting duct,
a rotatable shaft supported within said housing and having an upstream end and a downstream end, said downstream and projecting from said housing and having turbine blades mounted thereon for rotation of said shaft with movement of water through said duct,
a generator stator mounted within said housing and in axial alignment with said shaft,
a generator rotor having an inner ring and a peripheral rim with radially extending spaced apart pole structure therebetween,
generator rotor driving means for detachably coupling said rotor to said shaft and for supporting said rotor for rotation within said stator,
at least one detachable beam for mounting within said housing when said rotor is stationary, said at least one beam extending parallel to the axis of said shaft and passing through holes provided in said rotor,
shoe means for slidable engaging said at least one beam and engaging said rotor for supporting said rotor for sliding movement along said at least one beam, and piston means for applying a force to said rotor after said rotor driving means has been detached from said rotor for moving said rotor in an upstream direction clear of said stator.

4,447,740
WAVE RESPONSIVE GENERATOR

Louis J. Heck, 5229 Choctaw Dr., Baton Rouge, La. 70805

Continuation of Ser. No. 92,379, Nov. 8, 1979, abandoned. This application Oct. 13, 1981, Ser. No. 310,492
Int. Cl.³ F03B 13/12
U.S. Cl. 290—53 5 Claims

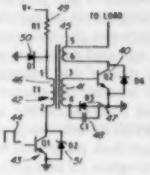


1. A free floating wave responsive generator comprising:
a. a buoyant float which freely bobs up and down responsive to the adjacent wave action during operation;
b. an outer fixed shaft depending downwardly from said float;
c. an inner drive shaft depending downwardly from and being rotatably mounted within said outer shaft to said float;
d. a turbine affixed to said drive shaft opposite said float;
e. a plurality of variable pitch vanes movably mounted on said turbine, said vanes transmitting rotational energy to said drive shaft responsive to upward and downward wave action on said float each of said vanes comprising a leading edge and a trailing edge, the area of the trailing edge being greater than the area of the leading edge, with fluid pressure acting generally vertically upon the vanes producing the variance of vane pitch responsive to the change of vertical direction of the float so that the drive shaft is rotated during both upward and downward movement of the float;
f. electric generator means cooperatively connected to said inner drive shaft for producing an electrical current responsive to the rotation of said drive shaft; and
g. a rotatable hub affixed to said drive shaft rotating freely with respect to the outer shaft at the lowermost portion thereof with said plurality of vanes attached to said hub, each of said vanes being movable between variable pitch positions responsive to fluid pressure thereon, the hub defining the travel limit of the vanes in each direction and a plurality of vane shafts radiating from the hub, each shaft supporting one of the vanes.

4,447,741
BASE DRIVE CIRCUIT FOR POWER TRANSISTORS

Anastasios Moschopoulos, Montreal, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 27, 1982, Ser. No. 424,087
Int. Cl.³ H02M 7/00; G05F 5/00
U.S. Cl. 307—31 3 Claims

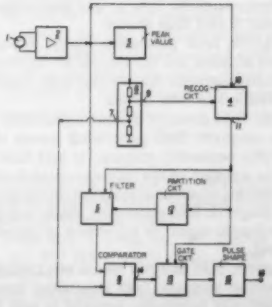


1. A base drive circuit for power transistors, comprising:
a power transistor;
a base drive transformer for said power transistor, connected to operate in a dual mode as a voltage transformer when in a switching condition and as a circuit transformer when said power transistor is conducting, said transformer including a primary winding and two secondary windings, one secondary winding connected at one end to the base of the power transistor and connected at the other end to a ground, and including a network between said other end and ground, said network including a diode and a capacitor in parallel to accelerate the turn off of the power transistor, the other secondary winding connected between the transistor and a load;
base drive means for driving said base drive transformer, said base drive means comprising a semi-conductor switch and means for applying control pulses to said switch, said primary winding connected to said switch.

4,447,742
DEVICE FOR GENERATING AN ELECTRIC TRIGGER PULSE

Heimo Denk, Feldbach; Peter Mantsch, and Werner Moser, both of Graz, all of Austria, assignors to Hans List, Graz, Austria

Filed Nov. 13, 1981, Ser. No. 321,046
Claims priority, application Austria, Nov. 28, 1980, 5836/80
Int. Cl.³ H03K 3/00
U.S. Cl. 307—106 4 Claims



1. A device for the generation of an electric pulse corresponding to the occurrence in time of an at least approximately

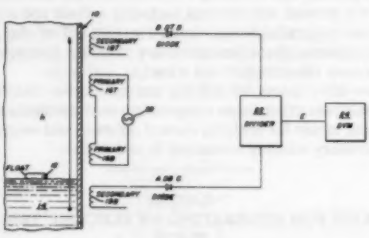
periodic event, comprising at least one sensor responding to the occurrence of said event, an evaluation unit connected to said sensor and fed by a sequence of electric signals therefrom, said evaluation unit in turn comprising a recognition circuit for delivering upon arrival of the sensor signals a stable recognition signal uncontaminated by noise, and a gate circuit connected to said recognition circuit and triggered by the occurrence of said recognition signal, the output of said gate circuit producing the pulse corresponding to the occurrence of said periodic event, wherein said evaluation unit further includes a partitioning circuit and a comparator circuit, with the partitioning circuit connected to said gate circuit and being responsive to said recognition circuit for partitioning into subintervals the time interval between the occurrence of two successive recognition signals and said partitioning circuit activating said gate circuit during one of said subintervals which has been predetermined, and wherein the sequence of signals from said sensor is fed to said comparator for transmitting an electric pulse to said gate circuit each time a predetermined signal level has been exceeded, which pulse will be available for further processing upon activation of said gate.

4,447,743

HIGH PRESSURE LIQUID LEVEL MONITOR

Vern E. Bean, Frederick, and Frederick G. Long, Ijamsville, both of Md., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 28, 1982, Ser. No. 372,861
Int. Cl.³ G01F *23/12*
U.S. Cl. 307—118 **10 Claims**



1. A system for tracking increases in liquid level in a vessel and generating a control signal therefrom comprising:

float means in said vessel movable along a vertical path with changes in said liquid level, said float means including magnetically permeable material;

first magnetic field generating means disposed outside said vessel adjacent the bottom thereof for applying an alternating electromagnetic field to said magnetically permeable material in said float means;

second magnetic field generating means disposed outside said vessel adjacent the top thereof for applying an alternating electromagnetic field to said magnetically permeable material in said float means;

first magnetic field detector means magnetically coupled to said first magnetic field generating means through the magnetically permeable material in said float means for sensing the strength of the magnetic field in the magnetically permeable material of said float means attributable to said first magnetic field generating means and generating a first float height signal as a function of increases in said liquid level;

second magnetic field detector means magnetically coupled to said second magnetic field generating means through the magnetically permeable material in said float means for sensing the strength of the magnetic field in the magnetically permeable material of said float means attributable to said second magnetic field generating means and generating a second float height signal as a function of increases in said liquid level;

first rectifier means connected to said first magnetic field detector means for converting said first float height signal from A.C. to D.C.;

second rectifier means connected to said second magnetic field detector means for converting said second float height signal from A.C. to D.C.;

divider means connected to said first and second rectifier means for dividing said second float height D.C. Signal by said first float height D.C. signal to generate a D.C. control signal which is a monitonically increasing function of float height; and

oscillator means for generating an alternating current signal of a predetermined frequency and amplitude for driving said first and second magnetic field generator means, said first magnetic field generator means including a first primary coil means disposed outside said vessel adjacent the bottom thereof and connected to said oscillator means for receiving said alternating current signal, generating an alternating electromagnetic field in response thereto and applying said field to said magnetically permeable material in said float means, said second magnetic field generator means including second primary coil means disposed outside said vessel adjacent the top thereof and connected to said oscillator means for receiving said alternating current signal, generating an alternating magnetic field in response thereto and applying said magnetic field to said magnetically permeable material in said float means, said first magnetic field detector means including first secondary coil means disposed adjacent said first primary coil means and magnetically coupled thereto through the magnetically permeable material in said float means, said first secondary coil means sensing the strength of said magnetic field attributable to said first primary coil means and generating a first float height signal as a function of increases in said liquid level, said second magnetic field detector means including second secondary coil means disposed adjacent said second primary coil means and magnetically coupled thereto through the magnetically permeable material in said float means, said second secondary coil means sensing the strength of said magnetic field attributable to said second primary coil means and generating a second float height signal as a function of increases in said liquid level.

4,447,744

CONTROL CIRCUITRY FOR HIGH VOLTAGE SOLID-STATE SWITCHES

Adrian R. Hartman, New Providence; James E. Kohl, North Brunswick, both of N.J.; William F. MacPherson, Winfield Township, DuPage County, Ill., and Terence J. Riley, Wyomissing, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

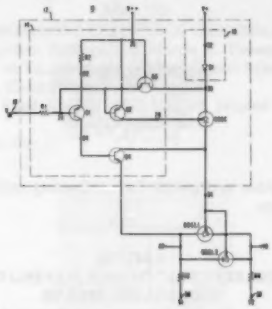
Filed Dec. 22, 1981, Ser. No. 333,434
Int. Cl.³ H03K *17/12, 17/72*
U.S. Cl. 307—252 R **10 Claims**

1. Control circuitry for use with a first switching device of the type comprising a semiconductor body having a bulk portion which is of relatively high resistivity, and a first region of a first conductivity type and of relatively low resistivity, and second and third regions of a second conductivity type opposite that of the first conductivity type, the first and third regions being connected to output terminals of the first switching device, the second region being coupled to a control terminal of the switching device, the first, second and third regions being mutually separated by portions of the bulk of the semiconductor body, a second switching device of the same type and essentially same electrical characteristics as said first switching device, an output terminal of the second switching device being coupled to the control terminal of the first switching device comprising:

third and fourth switching devices which each have a control terminal and first and second output terminals;

the control circuitry being capable of supplying up to a preselected level of current into the second switching device;

the control terminal of the third switching device and a first output terminal of the fourth switching device being coupled to a first control circuitry input terminal;



a second output terminal of the fourth switching device being coupled to a first output terminal of the second switching device;

the control terminal of the fourth switching device and the first output terminal of the third switching device being coupled together and being coupled to a second control circuitry terminal; and

a second output terminal of the third switching device being coupled to the control terminal of the second switching device.

4,447,745

BUFFER CIRCUIT INCLUDING A CURRENT LEAK CIRCUIT FOR MAINTAINING THE CHARGED VOLTAGES

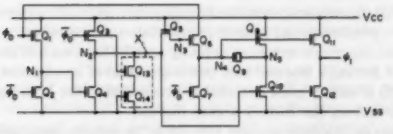
Yoshihiro Takemae; Seiji Enomoto, both of Yokohama; Shigeki Nozaki, Kawasaki; Tsutomu Mezawa, Aizuwakamatsu, and Katsuhiko Kabashima, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 18, 1981, Ser. No. 322,719

Claims priority, application Japan, Nov. 19, 1980, 55-162889

Int. Cl.³ H03K *5/135, 19/017, 19/096*

U.S. Cl. 307—269 **8 Claims**



1. A semiconductor circuit, having first and second power terminals respectively connectable to receive a power source voltage and a reference voltage, and used as a buffer circuit for providing an output clock signal in response to an input clock signal and an inverted input clock signal, comprising:

an input stage circuit, operatively connected to receive the input clock signal and the inverted input clock signal, for generating an output signal at a node in response thereto, the node being charged and maintained at the power source voltage during a standby period in which the input clock signal has a voltage lower than the voltage of the inverted input clock signal;

a bootstrap circuit, operatively connected to said input stage circuit, for generating a boosted signal in response to the output signal of said input stage circuit, said bootstrap circuit including a first field effect transistor operatively connected to the node, for receiving the output signal of said input stage circuit;

an output circuit, operatively connected to said bootstrap circuit, for generating the output clock signal, said output circuit including a second field effect transistor operatively connected to said bootstrap circuit for receiving the boosted signal; and

a current leak circuit operatively connected between the node of said input stage circuit and said second power terminal, for maintaining the voltage of the node being charged during the standby period at a value corresponding to the power source voltage, by leaking excess charges at the node to lower the voltage level of the node.

4,447,746

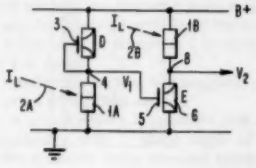
DIGITAL PHOTODETECTORS

Frank F. Fang, Yorktown Heights, and James C. McGroddy, Briarcliff Manor, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1981, Ser. No. 336,490

Int. Cl.³ H03K *17/687, 3/42*

U.S. Cl. 307—311 **12 Claims**



1. In a circuit of the type wherein a digital electrical signal is delivered in response to a change in light intensity, the improvement comprising

a first and a second stage connected between a reference potential and a power source potential,

said first stage including

a photosensitive member connected in series with a load between said reference potential and said power source potential providing across said photosensitive member in the presence of light a difference in potential with respect to said reference potential,

said second stage including

an enhancement mode field effect transistor having the source electrode thereof connected to said reference potential and the drain thereof connected in series with a load to said power source potential,

means applying said difference of potential across said photosensitive member to the gate electrode of said enhancement mode field effect transistor in said second stage, and

output signal means delivering an output signal appearing at the drain electrode of said enhancement mode field effect transistor in said second stage.

4,447,747

WAVEFORM GENERATING APPARATUS

David P. LaPotin, Arlington, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Mar. 2, 1981, Ser. No. 239,779

Int. Cl.³ H03K *13/11;* **H01L** *27/04*

U.S. Cl. 307—529 **6 Claims**

1. Monolithic integrated circuit structure comprising

a body of semiconductor material having a region of one conductivity type;

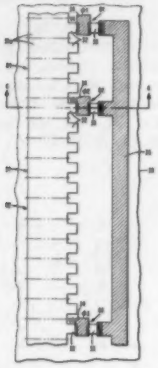
a linear resistance of semiconductor material of the opposite

conductivity type inset in said region of the one conductivity type;

said linear resistance being a series of contiguous resistance elements of approximately the same physical configuration and of approximately equal resistance value;

each resistance element including a projection of semiconductor material of the opposite conductivity type protruding into said region of the one conductivity type;

a plurality of sectors of semiconductor material of the opposite conductivity type inset in said region of the one conductivity type, the number of sectors being less than the number of resistance elements, said sectors being adjacent to but spaced from the projections of particular ones of said resistance elements; and



each sector and the projection adjacent thereto forming the drain and source regions, and the portion of the region of the one conductivity type therebetween forming the channel region of an MOS transistor;

wherein

the particular ones of said resistance elements are spaced from each other by sets of intervening resistance elements; and

the resistances of the sets of intervening resistance elements have a non-linear relationship, each of the intervening resistance elements of at least one of the sets being at least about 3 percent larger in resistance than each of the intervening resistance elements of at least another of the sets.

4,447,748

HIGH TEMPERATURE CORROSION AND EROSION RESISTANT ELECTRODE

William E. Young; Richard H. Lunn, and David H. Archer, all of Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 27, 1981, Ser. No. 257,682
Int. Cl.³ H02N *4/02*
U.S. Cl. 310—11 **10 Claims**

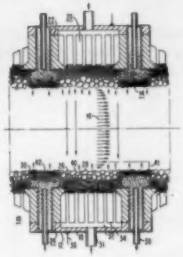
1. An electrode for a magnetohydrodynamic generator through which flows a high temperature plasma, comprising:

a metallic casing;

a porous distributor element, comprising a ceramic material, supported within said casing;

a porous, substantially electronically conductive matrix, comprising a ceramic material separating said distributor element and said casing from said plasma;

means for serially flowing combustion reactants through said distributor element, said matrix, and into said plasma;



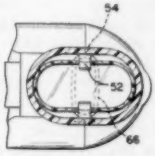
means within said matrix for combusting said combustion reactants.

4,447,749

CORDLESS ELECTRIC DEVICE HAVING CONTACT INCREASING MEANS

Irvin H. Reeb, Jr., Westminster, and Robert L. Beckhardt, Timonium, both of Md., assignors to Black & Decker Inc., Newark, Del.

Filed Jul. 29, 1981, Ser. No. 288,027
Int. Cl.³ H01R *13/62*
U.S. Cl. 310—71 **1 Claim**



1. A cordless electric tool having a motor mounted in a housing, a control switch in circuit with the motor to operate the same, a battery source connectable to the housing, said tool comprising:

(a) a hollow portion formed in the housing,

(b) the hollow portion having oppositely facing walls,

(c) a pair of resilient motor terminals individually fixedly connected in circuit with the motor,

(d) the motor terminals extending into the hollow portion in predetermined spaced relationship to each other,

(e) the motor terminals defining parallel legs, each of the legs having a free end bent in the direction of an adjacent wall,

(f) a battery pack detachably connected to the housing, and having the battery source therein,

(g) an insertion portion formed in the battery pack and said portion receivable within the hollow portion,

(h) a pair of battery terminals spaced from each other on opposite sides of the insertion portion and individually in circuit with the battery source,

(i) the pair of battery terminals and the pair of motor terminals to mate in individual pairs, respectively, to complete said circuit upon the battery pack's being connected to the housing, the resiliency of said motor terminals normally biasing said motor terminals into engagement with said battery terminals,

(j) resilient means connected in superposition to said pair of motor terminals adjacent said inserted battery terminals, for urging said motor terminals into increased mechanical and electrical connection with the respective mating bat-

tery terminals and for augmenting the biasing effect of the resiliency of said motor terminals,

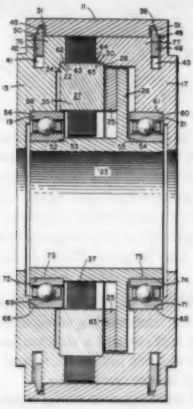
(k) the resilient means including an "O"-ring made of dielectric material, and

(l) the "O"-ring sized to fit within the space between the respective motor terminals and the adjacent wall and to be squeezed against said wall upon connection of the battery terminals to the motor terminals.

4,447,750
ELECTROMAGNETIC DEVICE CONSTRUCTION

James F. Howlett, Radford, and Marlin H. Thompson, Boones Mill, both of Va., assignors to International Scientific Industries, Inc., Christianburg, Va.

Filed Jun. 23, 1982, Ser. No. 391,464
Int. Cl.³ H02K *5/00*
U.S. Cl. 310—89 **8 Claims**



1. An electromagnetic device comprising:

a round tubular outer housing having respective annular grooves on an inner peripheral surface at opposite axial ends thereof, each of said grooves having a pair of opposing sidewalls and a bottom wall, one sidewall of at least one said grooves, which is closest to an axial end of said housing, being tapered so that the width of the groove having said tapered sidewall progressively decreases along its depth;

a stator assembly mounted within said housing;

a rotor assembly electromagnetically cooperating with said stator assembly and mounted within said housing;

bearing means for rotatably supporting said rotor assembly within said housing;

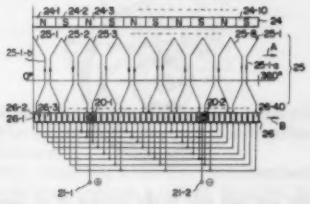
a pair of end bells respectively mounted at opposite axial ends of said housing, each said end bell having an outer circumferential periphery axially extending into a respective end of said housing, the said circumferential outer periphery of each end bell containing an annular groove therein which at least partially opposes a respective groove provided on the inner periphery of said housing, said end bells fixing between them said stator, rotor and bearing assemblies within said housing; and

a pair of C-clips respectively mounted within and engaging with the opposing grooves at each axial end of said housing, at least that C-clip which is mounted within said groove having said tapered sidewall having a tapered face which is complementary to said tapered sidewall so that said tapered side wall and tapered face engage upon radial expansion of the C-clip having the said tapered face to provide an axial face directed inwardly of said housing to bias said end bells toward one another and hold said stator assembly, rotor assembly and bearing assembly between said end bells.

4,447,751
DIRECT CURRENT MOTOR

Itsuki Ban, 829 Higashi-Oizumimachi, Nerima-ku, Tokyo; Manabu Shiraki, 4451-171 Shimotsuruma, Yamato-shi, Kanagawa-ken, and Kazuhito Egami, 2-44-1 Chuo, Nakano-ku, Tokyo, all of Japan

Filed Nov. 12, 1981, Ser. No. 320,534
Int. Cl.³ H02K *21/26*
U.S. Cl. 310—154 **4 Claims**



1. A direct current motor comprising:

a field magnet having 2mn magnetic poles magnetized with the same angular intervals as those of the magnetic poles N and S, where m is an integer of 1 or more, and n is an integer of 4 or more;

a magnetic member for closing the magnetic circuit of the magnetic poles of the field magnet;

an armature in which m(2n±2) armature coils are arranged each magnetically with a phase angle of 360/(2n±2) degrees, the armature being directed towards the magnetic poles in the magnetic circuit;

electric power supply control means for performing the switching of an armature current mn(2n±2) times per revolution of the armature with respect to the field magnet; and

a rotating shaft for rotatably supporting the armature or the field magnet, said rotating shaft being supported by a bearing disposed in an outer casing of the direct current motor, the terminal of an armature coil which has a closest relationship to its corresponding magnetic pole with respect to a relationship of any desired armature coil to its corresponding magnetic pole, and the terminal of said desired armature coil being connected together to said electric power supply control means so that the armature coils are wound in the same direction in the arrangement in which said armature coils correspond to said magnetic poles.

4,447,752
BALL CONTACT SLIP RING ASSEMBLY

Arthur J. Boyce, Cambridge, Mass., and David Gold, Tacoma Park, Md., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Jun. 7, 1982, Ser. No. 385,534
Int. Cl.³ H02K *13/00*
U.S. Cl. 310—232 **14 Claims**

14. A slip ring assembly comprising:

a generally cylindrical brush block having a centrally disposed, axially extending orifice;

a shaft disposed in said brush block orifice and being rotatable with respect to said brush block about the central axis of said brush block;

bearings disposed between said brush block and said shaft to permit relative rotation therebetween;

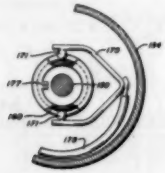
means for axially aligning said shaft with respect to said brush block;

a plurality of slip rings disposed about the outer circumference of said shaft, said slip rings being aligned axially adjacent one another along said shaft, each of said slip rings having a groove extending about the outer perimeter thereo;

means for electrically insulating each slip ring from the other;

a plurality of brushes disposed in said brush block, each of said brushes being associated with one of said slip rings and having a pair of opposed resilient arms arching about opposite sides of its associated slip ring groove;

a contact secured to each arm of each brush and being adapted to have a generally spherical contact surface



thereof seat and ride in the groove of an associated slip rings, said shaft rotates with respect to said brush block;

means disposed on said brush block for insulating each brush from the other and for forming slots permitting limited axial and radial movement of said brushes with respect to said brush block in response to radial and axial movement of said shaft with respect to said brush block;

means associated with each brush for conducting a signal from a location external of said slip ring assembly to its associated brush; and

means associated with each slip ring for conducting signals from its associated slip ring to a location external of said slip ring assembly.

4,447,753

MINIATURE GT-CUT QUARTZ RESONATOR

Osamu Ochiai, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Nov. 20, 1981, Ser. No. 323,487

Claims priority, application Japan, Mar. 25, 1981, 56-43371; May 7, 1981, 56-68829; Jun. 30, 1981, 56-102957

Int. Cl.³ H01L *41/04*

U.S. Cl. 310—312 **15 Claims**

1. A GT-cut quartz resonator comprising: a quartz crystal thin plate having a resonant portion having opposed relatively short sides and opposed relatively long sides, at least one supporting portion, and at least one bridge portion connecting the resonant and supporting portions; said resonant, supporting and bridge portions all being integrally formed as a single piece from the quartz crystal thin plate, said thin plate comprising a quartz crystal Y plate rotated around the X axis through an angle of 49° to 56°, and the Y plate being further rotated through an angle of ±(40° to 50°) inside the major surfaces thereof; and masses disposed along portions of the long sides of the resonant portion at a first set of locations at which the frequency-temperature coefficient is not effectively changed by the addition or reduction of the amount of the masses and at a second set of locations at which both the frequency-temperature coefficient and the resonance frequency are effectively charged by the addition or reduction of the amount of the masses.

4,447,754

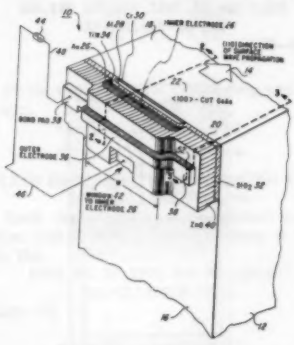
BROAD BAND SURFACE ACOUSTIC WAVE EDGE DEPOSITED TRANSDUCER

Robert S. Wagers, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 24, 1982, Ser. No. 422,810

Int. Cl.³ H01L *31/16*

U.S. Cl. 310—313 R **11 Claims**



1. A surface acoustic wave device comprising:

(a) a substrate for transmitting surface waves, said substrate having a top surface and a side surface forming a sharp, smooth edge at their intersection; and

(b) a transducer means comprising:

(i) a layer of transducer material having first and second opposing surfaces,

(ii) an inner metallic electrode deposited on the first surface of the transducer layer,

(iii) an outer metallic electrode deposited on the second surface of the transducer layer, and

(iv) means for energizing the electrodes for producing bulk longitudinal waves in the layer of transducer material, said transducer means operatively affixed to the substrate with its outer electrode a distance greater than about one-fifth of a wavelength below the sharp smooth edge of the substrate whereby the bulk longitudinal waves produce surface waves in the substrate with the bulk longitudinal waves coupled to the longitudinal component of the surface waves to produce a surface wave device operably at center frequencies above 200 MHz.

4,447,755

PIEZOELECTRIC TRANSDUCER ACCELEROMETER

Florin C. V. Ghiurea, Bucharest, Romania, assignor to Institutul de Cercetarea Stiintifica si Inginerie Tehnologica Pentru Industria Electrotehnica, Bucharest, Romania

PCT No. PCT/RO82/00001, 371 Date Aug. 27, 1982, 102(e) Date Aug. 27, 1982, PCT Pub. No. WO82/02602, PCT Pub. Date Aug. 5, 1982

PCT Filed Jan. 18, 1982, Ser. No. 414,378

Claims priority, application Romania, Jan. 20, 1981, 103157

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—329 **1 Claim**

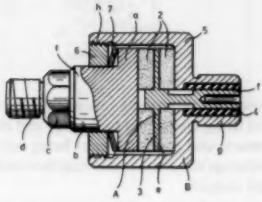
1. A piezoelectric transducer for accelerometer and vibration measurement studies which comprises:

a cylindrical casing forming a seismic mass and formed with an internal thread at one end and an axially extending

externally threaded tubular stem at an opposite end, said stem forming one pole for electrical connection to the transducer;

a pin extending from said one end of said casing axially and formed within said casing with a disk, a face of said disk confronting a face of said casing at said other end but spaced therefrom;

a pair of piezoelectric rings respectively abutting said faces and having parts of the same polarity turned toward one another;



a contact bolt extending axially from said other end of said casing, insulated relative to said other end of said casing by an insulating bushing, and formed within said casing with an annular flange disposed between the parts of the same polarity whereby said contact bolt forms a second pole for electrical connection to the transducer;

a gasket threaded into said casing at said one end, said pin extending through said gasket; and

a spring member braced against said gasket and urging said disk against said rings.

4,447,756

FLUORESCENT LAMP WITH LAYER OF PLURAL PHOSPHORS HAVING DIFFERENT PARTICLE SIZES

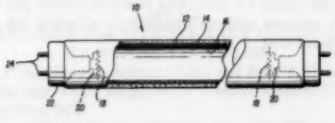
Kohtaro Kohmoto, Yokohama; Hiroyuki Ebara, Zushi, and Hisami Nira, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 23, 1981, Ser. No. 246,254

Claims priority, application Japan, Apr. 8, 1980, 55-45204

Int. Cl.³ H01J *61/44, 61/48*

U.S. Cl. 313—487 **7 Claims**



1. A fluorescent lamp, having a vacuum tight radiation transmitting envelope comprising mercury and rare gas, provided with electrodes between which the discharge takes place during operation and a luminescent layer which comprises a mixture of a plurality of phosphors each having a different density and a different particle size wherein when the plurality of phosphors are ranked in order of increasing densities, then the corresponding particle size of each of said phosphors is such that said phosphors are ranked in order of decreasing particle size.

4,447,757

STRUCTURE OF THIN-FILM ELECTROLUMINESCENT DISPLAY PANEL SEALED BY GLASS SUBSTRATES

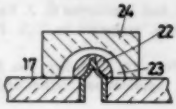
Masashi Kawaguchi, Nara; Toshiaki Ishii; Kinichi Isaka, both of Tenri, and Hisashi Uede, Wakayama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 11, 1981, Ser. No. 272,723

Claims priority, application Japan, Jun. 16, 1980, 55-81663; May 20, 1981, 56-77237

Int. Cl.³ H05B *33/04*

U.S. Cl. 313—509 **5 Claims**



1. A thin film electroluminescent display panel comprising:

first and second substrates disposed so as to define a cavity therebetween;

a composite comprising a thin-film electroluminescent layer interpositioned between a pair of dielectric layers, said composite being disposed within said cavity, at least one of said first and second substrates being transparent to light emitted by said electroluminescent layer when said layer is stimulated;

a pair of opposing electrodes positioned so as to sandwich said composite therebetween;

a protective liquid provided within said cavity defined by said substrates and being in contact with said dielectric layers;

an injection hole formed in at least one of said first and second substrates for introducing said protective liquid into said cavity, said substrate in which said injection hole is formed being glass, said injection hole being sealed; and

a glass covering means for completely covering said sealed injection hole.

4,447,758

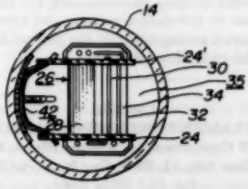
BROAD AREA CATHODE CONTACT FOR A PHOTOMULTIPLIER TUBE

Richard D. Faulkner, Lancaster; Dale V. Henry, Willow Street, and David L. Muth, East Petersburg, all of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 20, 1981, Ser. No. 323,236

Int. Cl.³ H01J *40/00*

U.S. Cl. 313—532 **6 Claims**



1. In a photomultiplier tube comprising an evacuated envelope having a generally cylindrical sidewall with a faceplate closing one end of said envelope, a conductive coating disposed on a portion of said sidewall adjacent to said faceplate, a photocathode formed on said faceplate and on a portion of said conductive coating, an electron multiplier assembly including a plurality of electrodes spaced from said photocathode, means for applying potentials to said electrodes of said electron multiplier assembly, and electrical contact means for

applying a potential to said photocathode, the improvement wherein said electrical contact means comprises

a resilient conductive contact member having securing means at opposite ends thereof, said securing means being affixed to said multiplier assembly so that said resilient contact member assumes a substantially arcuate shape which contacts and coaxially conforms to said conductive coating on said sidewall of said envelope.

4,447,759

STARTER FOR IGNITING AN ELECTRIC DISCHARGE TUBE

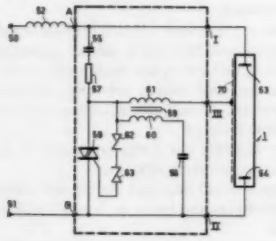
Jozef C. Moerkens, and Leonardus G. J. Verhees, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 16, 1981, Ser. No. 321,501

Claims priority, application Netherlands, Dec. 16, 1980, 8006802

Int. Cl.³ H05B *41/16, 41/00*

U.S. Cl. 315—60 **15 Claims**



1. A starter for igniting a discharge tube having two main electrodes and an auxiliary electrode, which comprises: two input terminals and three output terminals, the input terminals being adapted to be connected to an a.c. electric power supply source via an inductive stabilisation ballast, a first output terminal being adapted to be connected to a first main electrode of the discharge tube, a second output terminal being adapted to be connected to the second main electrode, and the third output terminal being adapted to be connected to the auxiliary electrode, means interconnecting the two input terminals by an arrangement of a current-limiting circuit element including a capacitor connected in series circuit with a voltage sensitive switching element, starter circuit means including the switching element for generating a voltage between the third output terminal and one of said output terminals, and means coupling the first and second output terminals to said series circuit arrangement of the current-limiting circuit element and the switching element so that, on connecting the first and second output terminals to the discharge tube, the tube is in parallel with the said series arrangement of the current-limiting circuit element and the switching element.

4,447,760

FILAMENT SWITCHING DEVICE

Ronald Koo, 29 Greenwood Rd., Morris Plains, N.J. 07950

Filed Aug. 11, 1980, Ser. No. 176,677

Int. Cl.³ H01J *7/44*

U.S. Cl. 315—65 **13 Claims**

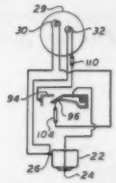
1. In an electric light having a translucent or transparent bulb sealing at least two filaments that are coupled by lead wires into a screw base, said bulb having an evacuation tube coaxially located within said screw base, a filament switching device comprising:

a frame having a floor which branches in two directions, said frame being sized to fit within said screw base and branch around said evacuation tube;

a fixed contact attached to said frame;

a cantilevered contact attached to said frame and operable to deflect laterally over said floor, said cantilevered contact being positioned to flex upon separation from said fixed contact, said cantilevered contact being positioned to deflect transversely to said evacuation tube; and

a fusible conductor, said frame including:



holding means for restraining one end of said conductor, its other end being connected to the free end of said cantilevered contact, said holding means being operable through said conductor to separate said cantilevered contact from said fixed contact.

4,447,761

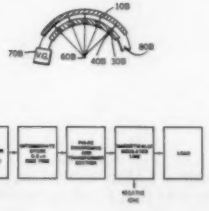
NEGATIVE ION GENERATOR

Regan W. Stinnett, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 11, 1982, Ser. No. 347,760

Int. Cl.³ H01J *27/02*

U.S. Cl. 315—111.81 **10 Claims**



1. A negative ion generator comprising:

a magnetically insulated transmission line including an elongate cathode having an emitting surface facing an elongate anode across a gap, said emitting surface having coating means for producing negative ions, and said anode having aperture means for the passage of negative ions; and

magnetic means for deflecting electrons which pass through said aperture without significantly effecting the flight of negative ions.

4,447,762

ELECTROLUMINESCENT DISPLAYS

Edward W. Williams, Reading, England, assignor to EMI Limited, Hayes, England

Filed Jul. 7, 1982, Ser. No. 396,121

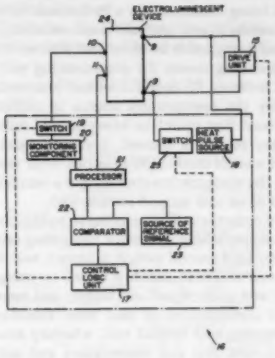
Claims priority, application United Kingdom, Jul. 9, 1981, 8121268

Int. Cl.³ H05B *33/08*

U.S. Cl. 315—116 **7 Claims**

1. An electroluminescent device including a number of electrically conducting electrodes, embedded in an insulating

layer within said device, and means for measurement of the electrical resistance between said electrodes, including means



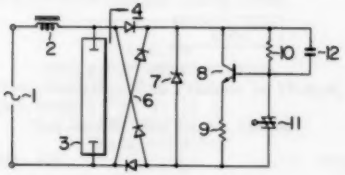
to apply heat to the electroluminescent device in response to said electrical resistance becoming less than a preset level.

4,447,763

DISCHARGE LAMP LIGHTING DEVICE

Hiroyuki Iyama, and Yoshio Watanabe, both of Tokyo, Japan, assignors to Hitachi Lighting, Ltd., Chiba, Japan

Filed Apr. 14, 1982, Ser. No. 368,163
Claims priority, application Japan, Apr. 15, 1981, 56-55581
Int. Cl.³ H05B *41/16*
U.S. Cl. 315—207 **10 Claims**



1. A discharge lamp lighting device comprising a serial circuit of an inductive ballast and a discharge lamp connected across an A.C. power source, and a switching circuit connected substantially in parallel to said discharge lamp, said switching circuit carrying out only two consecutive ON/OFF operations in the beginning of each half cycle of said A.C. power source during the lit condition of said discharge lamp.

4,447,764

POWER SUPPLY FOR LOW-VOLTAGE INCANDESCENT LAMP AND LIKE LOAD

William P. Kornrumpf, Albany, N.Y., and Paul T. Cote, Cleveland Heights, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed May 18, 1982, Ser. No. 379,393
Int. Cl.³ H05B *39/04*
U.S. Cl. 315—240 **34 Claims**

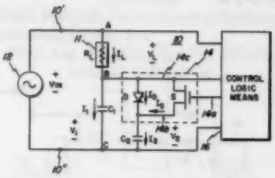
1. A power supply for energizing a load at a voltage magnitude less than the voltage magnitude provided by an A.C. source, comprising;

a first capacitive element in series connection with said load across said source, said first capacitive element having a reactance selected to cause the lowest magnitude of desired current flow through said load;

a second capacitive element;

a single active switching device having a path controlled, responsive to a control signal to connect said second capacitive element in parallel connection across said first capacitive element to allow current flow in a first of two directions with respect to said second capacitive element; and

a unidirectionally-conducting element in parallel with the controlled path of said switching device and poled to



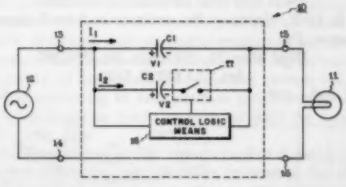
conduct current in the remaining one of two directions with respect to said second capacitive element; wherein conduction of said switching device and said unidirectionally-conductive element establishes a total load current by variation of a portion of the source waveform cycle during which an additional current flows through said second capacitive element and said load.

4,447,765

POWER SUPPLY FOR LOW VOLTAGE INCANDESCENT LAMP

Paul T. Cote, Cleveland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed May 18, 1982, Ser. No. 379,410
Int. Cl.³ H05B *39/04*
U.S. Cl. 315—240 **12 Claims**



1. A power supply providing power to a lamp, having a filament as its load, at a voltage magnitude less than the power supply input voltage magnitude comprising:

(a) a first capacitive element electrically serially connected with said load across the power supply input terminals;

(b) a second capacitive element;

(c) control means connected in parallel across said first capacitive element; and

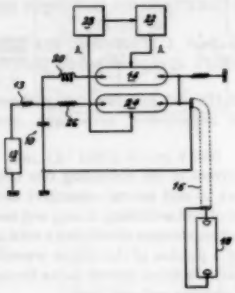
(d) a switching means responsive to a control signal generated by said control means for rendering said switching means conductive, said switching means being rendered conductive for electrically connecting said second capacitive element in parallel across said capacitive element during at least a portion of each power supply input waveform cycle.

4,447,766

SUPPLY DEVICE FOR A FLASH TUBE

Marcel Bedu, Clamart, and Marcel Jeanjean, Montgeron, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Sep. 16, 1981, Ser. No. 302,701
Claims priority, application France, Sep. 23, 1980, 80 2414
Int. Cl.³ H05B 41/32
U.S. Cl. 315—241 R 1 Claim



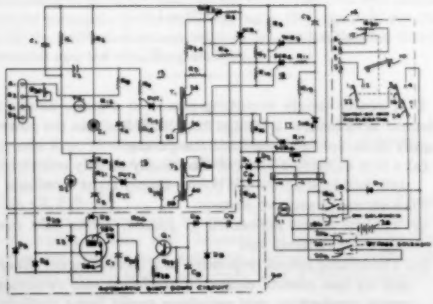
1. A supply device for a flash tube, comprising a capacitor, a d.c. voltage source connected to the capacitor, a first spark gap located between the capacitor and the flash tube, a circuit able to emit a first control pulse applied to said first spark gap, a second spark gap connected to the capacitor across a variable resistor and to the flash tube, and a second circuit able to emit a second control pulse for the second spark gap, said second control pulse being in advance of the first control pulse, said second control pulse closing said second spark gap and controlling a preionization current through said flash tube, said first control pulse occuring after said second control pulse during said preionization current and closing said first spark gap and controlling a main discharge through said flash tube, said main discharge being superimposed on said preionization current.

4,447,767

SCR MOTOR SPEED CONTROL

Luther D. Holt, Mahonoy, Pa., assignor to John J. Barni, Lake Harmony, Pa.

Filed Mar. 31, 1981, Ser. No. 254,160
Int. Cl.³ H02P 7/00
U.S. Cl. 318—139 4 Claims



1. Apparatus for variably controlling the application of a D.C. energization source to a motor, said apparatus comprising:

(a) main switching means commutable between a conductive state and a nonconductive state to respectively connect and disconnect the energization source to said motor;

(b) a solenoid having a first, normally open switch, said first switch being connected by a first circuit in series with the energization source and said main switching means, and a first coil energizable to close said first switch;

(c) commutating means for commutating said main switch means between its conductive and nonconductive states, whereby the energization source is connected through said closed first switch to energize said motor;

(d) a relay having a second, normally open switch, said second switch connected in series with said first switch across the energization source, and a second coil energizable to close said second switch; and

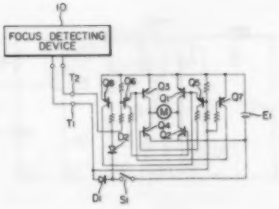
(e) failure detector means responsive to the commutation of said main switching means for energizing said second coil, whereby said second switch is closed, said first coil energized and said first switch is closed to complete said first circuit and to energize said motor, and responsive to the lack of commutation of said main switching means for deenergizing said second coil, whereby second switch is opened, said first coil deenergized and said first switch opened to disconnect the energization source from said motor when said main switch means fails to commutate.

4,447,768

MOTOR CONTROL DEVICE

Nobuhiko Terui, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jun. 14, 1982, Ser. No. 388,152
Claims priority, application Japan, Jun. 23, 1981, 56-92682[U]
Int. Cl.³ G03B 3/10; H02P 3/12
U.S. Cl. 318—293 2 Claims



1. A motor control device comprising:

(a) a transistor bridge circuit comprising first and second transistors connected in series with each other and third and fourth transistors connected in series with each other;

(b) a motor connected between the junction between said first transistor and said second transistor and the junction between said third transistor and said fourth transistor;

(c) means for producing first and second output signals, said means having first and second terminals from which said first and second output signals are transmitted, respectively;

(d) a first switching element connected to said first terminal and responsive to said first output signal to cause said first transistor and said fourth transistor opposed to each other diagonally in said bridge circuit to conduct;

(e) a second switching element connected to said second terminal and responsive to said second output signal to cause said second transistor and said third transistor opposed to each other diagonally in said bridge circuit to conduct;

(f) a third switching element connected to said first terminal and responsive to said first output signal to cause said third transistor to turn off forcibly; and

(g) a fourth switching element connected to said second terminal and responsive to said second output signal to cause said first transistor to turn off forcibly.

4,447,769

REDUNDANT ACTUATION SYSTEM

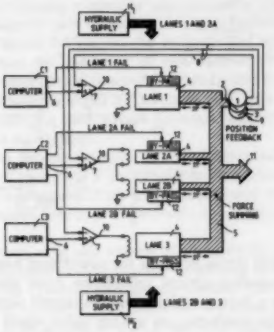
John M. Corney, Kent, England, assignor to Elliott Brothers (London) Limited, England

Filed Jan. 19, 1982, Ser. No. 340,835

Claims priority, application United Kingdom, Mar. 11, 1981, 8107619

Int. Cl.³ G05B 9/02

U.S. Cl. 318—564 4 Claims



1. A redundant actuator system comprising: a first plurality of sub-actuators in which some sub-actuators have a lower force capability than the remaining sub-actuator(s); and a second plurality of electrical control circuits which control the sub-actuators, said sub-actuators with the lower force capability being controlled by a common single electrical control circuit, the remaining sub-actuators being each controlled by a respective independent electrical control circuit.

4,447,770

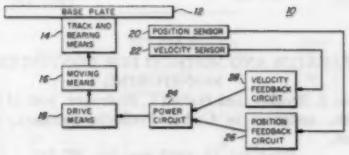
PRECISION DRIVE SYSTEM

Orr Shepherd, Arlington, Mass., assignor to Visidyne, Inc., Burlington, Mass.

Filed Jan. 26, 1981, Ser. No. 228,630

Int. Cl.³ G05B 5/01

U.S. Cl. 318—618 7 Claims



1. A precision drive system comprising:

a baseplate; track means and air bearing means movable relative to one another, one of said means being fixed to said baseplate and the other being movable for carrying an object to be moved relative to the baseplate; precision lead screw means and drive nut means for moving one of said track and air bearing means; an electric servo motor for driving one of said precision lead screw means and drive nut means; and a control circuit including a power circuit for operating said electric servo motor; a tachometer for detecting the velocity of the movable one of said track and air bearing means, and a velocity feedback circuit for introducing velocity error signals into said power circuit; an LVDT to detect the position of the movable one of said track and air bearing means and a position feedback circuit for introducing position error signals to said power circuit, said power circuit including means for generating sawtooth output signals and means for summing said sawtooth output signals with said velocity error signals and said position error signals to provide corrected velocity and position signals for operating said electric servomotor.

4,447,771

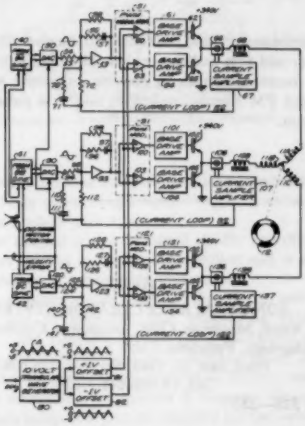
CONTROL SYSTEM FOR SYNCHRONOUS BRUSHLESS MOTORS

James S. Whited, Radford, Va., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Aug. 31, 1981, Ser. No. 297,676

Int. Cl.³ G05B 1/06

U.S. Cl. 18—661 18 Claims



1. A motor control system for a brushless DC motor comprising:

a brushless DC motor including

stator windings;

a permanent magnet rotor and

a position indicator for indicating the position of said rotor relative to said stator windings;

excitation current generating circuit means responsive to said position indication from said position indicator and connected to provide sinusoidal excitation current to said stator windings, said sinusoidal excitation current being incrementally synthesized according to digital values; the frequency of said sinusoidal excitation current being controlled according to said position indication to create a rotating magnetic field synchronous with the rotation of said rotor; and

torque angle control circuit means coupled to said excitation current generating circuit means to control the phase of said sinusoidal excitation current to dynamically control the angle between said rotating magnetic field created by said stator winding and the rotor position.

4,447,772

TEMPERATURE STABLE PULSE COUNTING FM DETECTOR

Ronald V. DeLong, Mesa, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Sep. 25, 1981, Ser. No. 305,586

Int. Cl.³ H03D 3/28

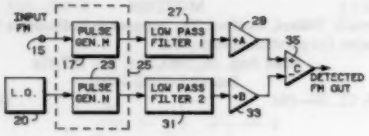
U.S. Cl. 329—126 7 Claims

1. A temperature stable FM detector comprising:

(a) first and second pulse generating circuits formed on a single semiconductor chip, said first pulse generating circuit being adapted to receive an FM signal to be detected and to generate output pulses in response thereto

and said second pulse generating circuit being adapted to receive a reference frequency signal and to generate output pulses in response thereto;

(b) first and second low pass filters connected to receive the output pulses from said first and second pulse generating circuits, respectively; and



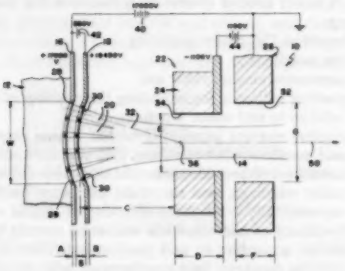
(c) combining means connected to receive filtered signals from said first and second low pass filters for combining the received signals to provide an output signal of detected FM signals applied to said first pulse generating circuit.

4,447,773

ION BEAM ACCELERATOR SYSTEM

Graeme Aston, Montrose, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Jun. 22, 1981, Ser. No. 276,076
Int. Cl.³ H05H *5/02*
U.S. Cl. 328—233 **11 Claims**



1. An ion beam accelerator system for accelerating ions of an ion source, comprising:

a pair of slightly spaced extraction grids having upstream faces facing the ion source, a first of said grids being positioned upstream from a second of said grids, said grids forming a plurality of pairs of holes, one in each grid, with said pairs of holes aligned in directions to form a plurality of converging beamlet paths;

an accelerator electrode device spaced downstream from said extraction grids by more than twice the space between said pair of grids, including a first electrode with a hole for passing said beamlets; and

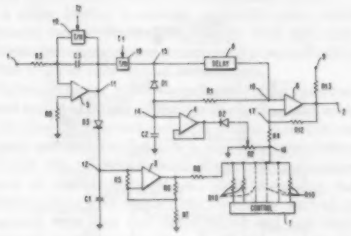
means for establishing said second grid at a negative potential relative to said first grid, and for establishing said first accelerator electrode at a negative potential with respect to both of said grids, the potential difference between either grid and said first electrode being a plurality of times greater than the potential difference between said pair of grids.

4,447,774

VIDEO SIGNAL DETECTOR

Nils G. Stalberg, Lidingo, Sweden, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 28, 1981, Ser. No. 306,632
Claims priority, application Sweden, Oct. 8, 1980, 8007037
Int. Cl.³ H03K *5/05, 5/153*
U.S. Cl. 328—150 **7 Claims**



1. A video signal detector for converting analog video signals representing optical reflectance from successive small regions on a document into a digital output signal comprising

means for producing an analog video signal that varies in magnitude as a function of optical reflection,

means responsive to said video signal for developing a white level peak representative voltage signal,

means responsive to said video signal for developing a black level peak representative voltage signal,

means responsive to said white level peak representative signal and said black level peak representative signal for developing a threshold level voltage signal,

comparing means responsive to said video signal and to said threshold level signal for producing a digital output signal,

a diode connected between said black level peak signal developing means and said threshold level signal developing means, said diode being oriented to permit conduction in the presence of black level voltage signals, and

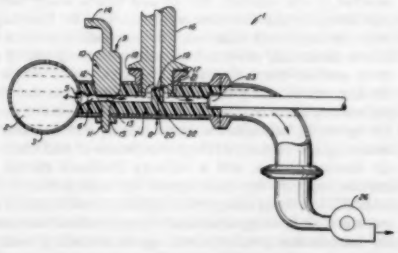
means supplying back bias to said diode for preventing conduction therethrough in the presence of relatively small black level voltage signals but permitting conduction therethrough in the presence of relatively large black level voltage signals.

4,447,775

APPARATUS AND METHOD FOR CONTINUOUS PH MONITORING

Stephen J. Breuker, and Harold L. Richmann, both of Fremont, Mich., assignors to Gerber Products Company, Fremont, Mich.

Filed Jul. 12, 1982, Ser. No. 397,727
Int. Cl.³ G01N *27/38, 27/56*
U.S. Cl. 324—438 **8 Claims**



1. An apparatus for the continuous and substantially current

measurement of the pH of a fluid in a process stream conduit using a glass electrode not in contact with said process stream and entailing a minimal loss of process fluid, said apparatus comprising:

an enclosed sample conduit extending laterally from said process conduit to divert therefrom a portion of said fluid, said portion completely filling said sample conduit, with means in the wall of said sample conduit for receiving the pH-sensing surface of said electrode in fluid-tight relation to said wall, the portion of said wall facing said pH-sensing surface having a contour approximately complementary in shape to said surface with a gap therebetween of less than about 0.5 cm on the average and substantially smaller than the diameter of said sample conduit, the diameter ratio of said process conduit to said sample conduit ranging from about 5:1 to about 50:1, and

means for drawing said stream through said conduit at a controlled steady rate.

4. A method for the continuous and substantially current measurement of the pH of a stream of fluid in a process stream conduit using a glass electrode in a non-intrusive manner and entailing a minimal loss of process fluid, said method comprising:

drawing a portion of said stream at a controlled steady rate into an enclosed sample conduit extending laterally from said process conduit, said sample conduit containing the pH-sensing surface of said electrode enclosed therein, the diameter ratio of said process conduit to said sample conduit ranging from about 5:1 to about 50:1, said portion completely filling said sample conduit,

passing said portion through a passage within said sample conduit defined by the pH-sensing surface of said electrode and an opposing face of said conduit wall having a contour approximately complementary in shape to said surface with a gap therebetween of less than about 0.5 cm on the average and substantially smaller than the diameter of said sample conduit, and

detecting the signal generated by said electrode.

4,447,776

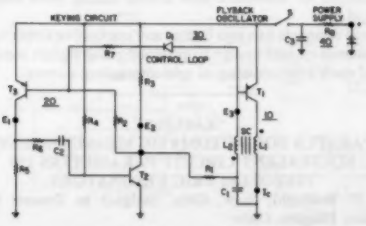
PULSE DRIVER FOR FLUX GATE MAGNETOMETER

Robert E. Brown, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 24, 1981, Ser. No. 256,868

Int. Cl.³ G01R *33/04*

U.S. Cl. 324—253 **8 Claims**



1. A pulse driver for a fluxgate magnetometer comprising:

a saturable core having first and second windings thereon,

a pulse generator coupled to said first winding operable to provide a core saturating pulse to said winding,

a keying circuit coupled to said pulse generator continuously operable to disable said generator when actuated and to enable and subsequently disable said pulse generator after a period of time,

a control circuit coupled to said second winding and to said keying circuit operable to actuate said keying circuit upon the occurrence of a regenerative pulse in said second winding following core saturation.

4,447,777

MAGNETIC PIPELINE INSPECTION VEHICLE WITH METALLIC FOIL AND BRISTLE CONTACTS SUPPORTING THE VEHICLE

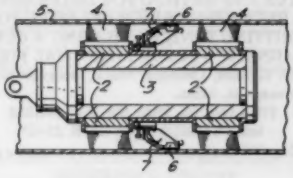
Michael R. G. Sharp, Whitley Bay, and John C. Braithwaite, Ponteland, both of England, assignors to British Gas Corporation, London, England

Filed Dec. 15, 1980, Ser. No. 216,499

Claims priority, application United Kingdom, Oct. 17, 1980, 8033618

Int. Cl.³ G01N *27/72, 27/82*

U.S. Cl. 324—220 **26 Claims**



1. A magnetic pipeline inspection vehicle comprising:

a vehicle body comprising a rigid, elongated, annular, magnetic flux-return-path member;

permanent magnet means mounted rigidly and directly on the outer surface of the annular member and in magnetic flux conducting relationship thereto; and

magnetic coupling means mounted directly on said magnet means and in magnetic flux conducting relationship thereto, said coupling means being positioned so as to engage the inner surface of a pipeline being inspected when the vehicle is in the pipeline to thereby couple the magnet means and the pipeline in magnetic flux conducting relationship and provide support for the vehicle as it travels in the pipeline.

4,447,778

APPARATUS FOR SECURING STORAGE TAPE ON A TEST PIECE DURING MAGNETOGRAPHIC TESTING

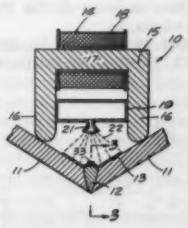
Wolfgang Stumm, Reutlingen, Fed. Rep. of Germany, assignor to Institut Dr. Friedrich Förster Prüfgerätebau, Reutlingen, Fed. Rep. of Germany

Filed Jun. 19, 1981, Ser. No. 275,318

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1980, 3026540

Int. Cl.³ G01N *27/85*; G01R *33/10*

U.S. Cl. 324—213 **4 Claims**



1. Apparatus for magnetographic testing areas of a magnetizable test piece including an elongated flexible elastic magnetic storage tape overlying the magnetizable test piece, magnetizing means with a yoke and two pole shoes for introducing magnetic flux into the test piece, an energizing coil encircling the yoke, a source of electric current, and means for connecting the yoke coil to the electric current source, comprising:

means carried by and located between the pole shoes, said means being made of a stable shape material to encircle a certain volume of fluid, and having a nozzle facing toward the storage tape overlying the test piece;

a source of compressed fluid; and

means interconnecting the source of compressed fluid to the means carried by and located between the pole shoes for directing the compressed fluid onto the storage tape and forcing said tape into continuous intimate contact with the test piece.

4,447,779

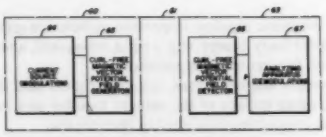
APPARATUS AND METHOD FOR DETERMINATION OF A RECEIVING DEVICE RELATIVE TO A TRANSMITTING DEVICE UTILIZING A CURL-FREE MAGNETIC VECTOR POTENTIAL FIELD

Raymond C. Gelinas, Concord, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 20, 1980, Ser. No. 198,553

Int. Cl.³ G01B *7/14;* **G01R** *33/02*

U.S. Cl. 324—207 **8 Claims**



1. Apparatus for determining a direction between a first location and a second location comprising:

a source of radiation positioned at said first location and providing a substantial curl-free magnetic vector potential field;

a plurality of means at said second location for detecting said curl-free magnetic vector potential field, each of said plurality of means for detecting responsive to a component of said curl-free magnetic vector potential field having predetermined spatial orientation with respect to components detected by remaining ones of said plurality of means for detection; and

means coupled to said plurality of means for detecting for determining an orientation of said vector field from said spatial orientation of said components.

4,447,780

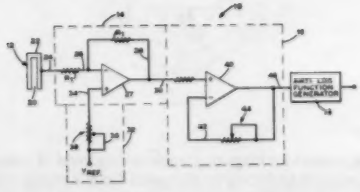
LINEARIZING CIRCUIT AND METHOD OF CALIBRATING SAME

Barry J. Youmans, Rittman, and Sharon L. Zimmerlin, Chagrin Falls, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Oct. 28, 1981, Ser. No. 315,783

Int. Cl.³ G01R *15/10;* **B01D** *59/40*

U.S. Cl. 324—132 **10 Claims**



1. A linearizing circuit for an oxygen detector having a logarithmic output range with a polarity change within the output range comprising:

biasing circuit means for zeroing one end point of the logarithmic output range of the oxygen detector to eliminate the polarity change within the output range;

scaling circuit means connected to said biasing circuit means for adjusting a second point on the logarithmic output range of the oxygen detector; and

converting means connected to said scaling circuit means for changing the logarithmic output of said scaling circuit means to a linear output.

4,447,781

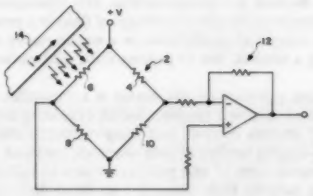
MAGNETORESISTIVE TRANSDUCER APPARATUS

Martin J. van Dyke, Brooklyn Park, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 13, 1981, Ser. No. 310,580

Int. Cl.³ H03D *15/00*

U.S. Cl. 324—83 A **10 Claims**



1. A zero-crossing signal detector for alternating current in an electrical conductor, said detector comprising:

a magnetoresistive bridge positioned adjacent to said conductor to be responsive to the alternating magnetic field produced about said conductor incident to the passage of said alternating current through said conductor,

said bridge having a first pair of opposite arms each having a magnetoresistive element therein, and a second pair of opposite arms each having a magnetoresistive element therein, said magnetoresistive elements in said first pair of arms being oriented transversely with respect to said magnetic field and said magnetoresistive elements in said second pair of arms being oriented longitudinally with respect to said magnetic field,

said bridge being electrically balanced in the absence of said field and the magnetoresistive elements in one pair of said opposite arms being magnetically saturated during a significant interval of each half cycle of said alternating current to unbalance said bridge during such intervals, and

means connected to said bridge and responsive to the state of balance of said bridge to produce pulse signals indicative of each zero crossing of said alternating current.

4,447,782

APPARATUS FOR AUTOMATIC MEASUREMENT OF EQUIVALENT CIRCUIT PARAMETERS OF PIEZOELECTRIC RESONATORS

John P. Rutkoski, Stow, Ohio, assignor to Transat Corp., Shaker Heights, Ohio

Filed Mar. 17, 1982, Ser. No. 359,060

Int. Cl.³ G01R *29/22;* **H03L** *7/00*

U.S. Cl. 324—56 **8 Claims**

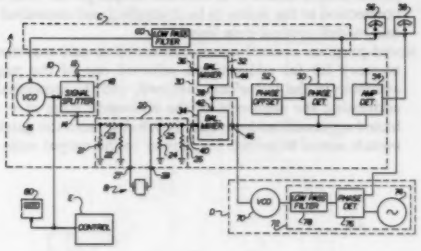
1. An apparatus for measuring a characteristic frequency of a piezoelectric resonator comprising:

a variable frequency test signal generating means for generating a variable frequency test signal;

an analog heterodyne reference signal generating means for generating a selectively variable heterodyne reference signal;

heterodyne means for receiving the variable frequency heterodyne reference signal, the selectively variable test signal, and the selectively variable test signal received by

way of the piezoelectric resonator whose characteristic frequency is to be measured, the heterodyne means producing a pair of fixed frequency test signals which have substantially the preselected fixed frequency and whose phase relationship is the same as the phase relationship between the signals received by the heterodyne means, whereby the phase difference between the fixed frequency test signals varies as a function of the difference between the characteristic frequency of the piezoelectric resonator and the frequency of the variable frequency test signal;



heterodyne reference signal generator control means operatively connected with one of the fixed frequency test signals for controlling the heterodyne reference signal generating means such that the frequency of the variable heterodyne reference signal is the frequency of the variable frequency test signal offset by a preselected fixed frequency;

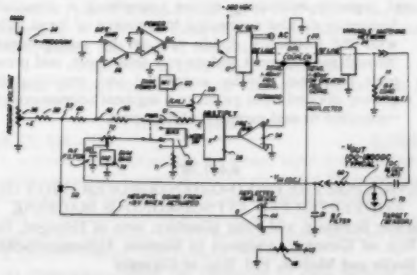
phase detecting means operatively connected with the fixed frequency test signals for producing a phase output signal which varies with the phase difference between the fixed frequency test signals.

4,447,783

PROGRAMMABLE RF POWER REGULATOR (STABILIZER)

Donald L. Quick, Mountain View, Calif., assignor to The Perkin-Elmer Corp., Norwalk, Conn.

Filed May 19, 1982, Ser. No. 379,696
Int. Cl.³ H04B *1/04*
U.S. Cl. 323—275 **8 Claims**



1. A power supply regulator for generating a regulated RF power output to a load of variable impedance at a level proportional to a voltage level of an applied input control signal comprising,

power circuitry including AC power input cicuitry,

input control circuitry responsive to an external control and providing said control signal voltage level which is proportional to the desired power output of the power supply,

power measuring means coupled to said power circuitry for generating output voltage signals proportional to the forward and reflected power applied to said load,

signal comparison means coupled to said power measuring means and to said input control circuitry for generating an output signal proportional to a signal applied to said signal comparison means which comprises the sum of said forward power voltage signal and said control signal voltage level,

power control means coupled to said signal comparison means and responsive to said output signal for controlling the power output of said power circuitry, and

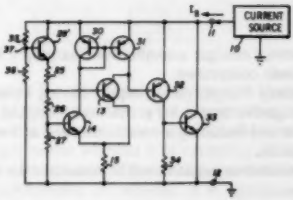
limiting circuitry coupled to said power measuring means and responsive to said reflected power voltage signal and to a predetermined threshold voltage signal for overriding signal applied to said signal comparison means for reducing the forward power of said power circuitry whenever the reflected power signal exceeds said threshold voltage signal.

4,447,784

TEMPERATURE COMPENSATED BANDGAP VOLTAGE REFERENCE CIRCUIT

Robert C. Dobkin, Hillsborough, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 21, 1978, Ser. No. 888,721
Int. Cl.³ G05F *1/613, 3/20*
U.S. Cl. 323—226 **2 Claims**



1. A constant voltage reference circuit comprising:

first and second terminals for developing a constant potential therebetween in response to a current passed between said terminals;

first and second transistors, each having emitter, base and collector electrodes;

means for coupling said first and second transistor emitters together and, through a common current source, to said second terminal;

means coupled to said first and second transistor collectors for developing a differential output potential therebetween;

means for operating said first transistor at a higher current density than said second transistor;

first voltage divider means coupled between said first and second terminals, said first voltage divider including first and second intermediate potential points coupled respectively to said base electrodes of said first and second transistors, with said second potential point being closer to the potential of said second terminal than said first potential point;

amplifier means having an input responsive to said differential output of said first and second transistors and an output coupled to said first voltage divider means, said amplifier means being operative to force said differential to substantially zero by controlling the potential difference between said first and second intermediate potential points;

second voltage divider means coupled between said first and second terminals, said second voltage divider having at least one intermediate potential point operating at the

bandgap potential of the transistor semiconductor material; and

diode means coupled in series relationship with said first voltage divider means, said diode means being operative to develop a voltage having negative temperature coefficient to compensate the positive temperature coefficient of said potential difference between said first and second intermediate potential points, said diode means comprising the emitter-base circuit of a third transistor having an emitter coupled to said first voltage divider, a base coupled to said intermediate potential point on said second voltage divider and a collector coupled to said first terminal whereby the potential between said first and second terminals can be stabilized at any desired potential above said bandgap.

4,447,785

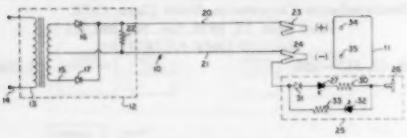
BATTERY CHARGER ASSEMBLY

Bruce R. Wright, 1006 Nana, St. Louis, Mo. 63131

Filed Mar. 30, 1982, Ser. No. 363,452

Int. Cl.³ H02J *7/00*

U.S. Cl. 320—25 **8 Claims**



1. A battery charger assembly for charging a battery with two terminals comprising:

(a) a battery charger power supply having a positive output and negative output for providing a rectified DC voltage output and including a transformer and at least one rectifier diode,

(b) a continuous negative cable connected to the negative output,

(c) a continuous positive cable connection to the positive output,

(d) a pair of clamps, one clamp being connected to each of the cables, and

(e) polarity indicating means connected to one of the clamps, the polarity indicating means including:

1. a test contact for contacting a terminal of the battery,

2. a first indicator serially connected between the test contact and said one of said clamps for indicating a first polarity connection, and

3. a second indicator serially connected between the test contact and said one of said clamps for indicating a second opposite polarity condition, whereby when said test contact is brought into contact with said terminal of the battery and the other of said clamps is connected to the other terminal of the battery, an electrical circuit between the battery terminals will be completed through the battery charger assembly, said electrical circuit including said test contact, said first or second indicator, said one of said clamps, one of said cables, the other of said cables, and said other clamp.

4,447,786

WAVEFORM SYNTHESIZER AND MOTOR CONTROLLER

David A. Saar, Timonium, and Pradeep Bhagwat, Baltimore, both of Md., assignors to Black & Decker Inc., Newark, Del.

Filed Feb. 12, 1982, Ser. No. 348,319

Int. Cl.³ H02P *5/40*

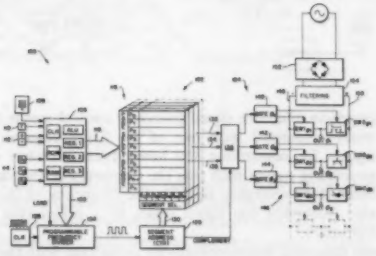
U.S. Cl. 318—811 **14 Claims**

1. A motor controller for selectively controlling an AC motor by providing a controlled power waveform thereto of selected wave shape and frequency, said motor controller comprising:

a waveform memory means divided into p addressable pages representing p available wave shapes with each page divided into s addressable segments, the segments of each page having binary switch control information stored therein, the pages and the segments of each page addressable through a memory address port to provide the so-addressed switch control information to switch control data lines;

selectively gatable switch means connected between a DC power source means to at least one output power node for connection to the motor to be controlled and connected to said switch control data lines;

stored-program control means connected to said waveform memory for (a) addressing a selected one of the pages available in the waveform memory, and (b) sequentially addressing the segments of the addressed page at a selected sequential address rate to thereby cause the gatable switch means to switch DC power to the output node to



synthesize a waveform of selected waveform and wave shape in accordance with the stored binary switch control information of the addressed page;

said stored program control means including a stored-program-controlled processor means having an address output port connected to said memory address port for providing an addressing rate select signal, and a segment addressing means connected to said memory address port for sequentially addressing the segments of an addressed page at a selected addressing rate and connected to said address rate control port so as to provide a selected addressing rate in response to an addressing rate select signal provided from said processor means; and wherein

said segment addressing means comprising a presettable frequency divider connected to a source of input pulses with the frequency divide rate set by said processor through said segment address rate select port, said presettable frequency divider connected and providing frequency divided input pulses to a segment address counter connected to said memory address port.

4,447,787

DEVICE FOR THE FIELD-ORIENTED OPERATION OF A CONVERTER-FED ASYNCHRONOUS MACHINE

Guenter Schwesig, and Felix Blaschke, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 13, 1981, Ser. No. 292,614

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1980, 3034252

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—803 **16 Claims**

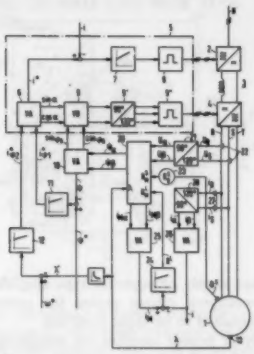
1. Apparatus for operating a converted asynchronous electric motor which comprises:

(a) a flux computer for determining the position of the flux vector from the input values for the stator voltage provided by said motor by solving all the electrical quantities of the Park equations describing said motor in a given

position of the rotor axis, taking into acount the parameter values corresponding to the rotor resistance and the stator resistance of said motor whereby signals corresponding to the position of the flux vector and belonging to a solution, can be tapped from said flux computer, said flux computer comprising:

(1) first feeding means for feeding the input value for the actual stator voltage to the computer;

(2) second feeding means for feeding an input value for the actual rotor position to the computer;



(3) first storage means for storing the rotor resistance parameter; and

(4) second storage means for storing the stator resistance parameter;

(b) a converter control unit coupled to said flux computer and said converter rectifier respectively, forming the control quantities for driving the converter rectifier from the determined position of the flux vector and from the nominal input values which fix the components of the stator current vector parallel and perpendicular to the flux vector.

4,447,788

METHOD FOR OPTIMIZING THE POWER INPUT OF A PLURALITY OF HYSTERESIS MOTORS CONNECTED IN PARALLEL

Johann Mundt, Jülich-Koslar; Horst Kasper, Geilenkirchen, and Eckhard Pritsch, Jülich-Koslar, all of Fed. Rep. of Germany, assignors to Uranit Uran-Isotopentrennungs-Gesellschaft mbH, Jülich, Fed. Rep. of Germany

Filed Nov. 3, 1982, Ser. No. 438,945

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1981, 3151904

Int. Cl.³ H02P *5/46*

U.S. Cl. 318—799 **3 Claims**

1. A method for optimizing the power input to a plurality of parallel connected hysteresis motors all having the same given rated voltage, wherein a three phase alternating voltage source jointly supplies the motors with operating voltage, the voltage source being adjustable within predetermined limits by means of a control voltage, said method comprising:

(a) measuring, during the operation of each parallel connected motor, the phase angle difference between the voltage supplied to the motor and the motor current;

(b) determining the power factor from the measured phase angle difference for each motor;

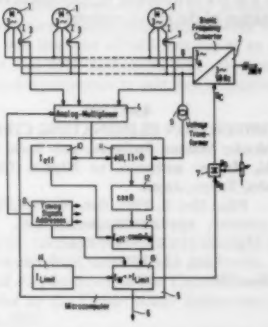
(c) measuring the effective value of the current of each motor during operation;

(d) combining the respective effective current values and power factors to determine the active current component for each motor during operation;

(e) measuring and storing the limit value of the active current component at which each motor transitions from synchronous to asynchronous operation, said limit value measuring and storing being conducted only once for each motor prior to commencement of continuous synchronous operation;

(f) allowing each motor to reach synchronous speed while maintaining the supply voltage at rated voltage;

(g) while maintaining synchronous speed, adjusting the control voltage of the voltage supply to reduce the voltage jointly supplied to the motors from rated voltage to an optimum working point which is close to the voltage level at which a first one of said parallel connected motors begins to transistion from synchronous to asynchronous operation, whereby the active and reactive power inputs are reduced to a substantially minimum value at the optimum working point;



(h) comparing the active current component of each motor, after said adjusting step, with a respective one of the stored active current component limit values to determine as to each motor whether it is operating with its active current below the stored limit value and therefore operating synchronously or whether it is operating with its active current at or above the stored limit value and therefore operating asynchronously; and

(i) regulating the control voltage of the voltage source for increasing the voltage jointly supplied to the motors to the rated voltage value when said comparing step determines that one of said motors is operating asynchronously and for decreasing the voltage jointly supplied to the motors to the optimum working point when the motors are all determined to be operating synchronously.

4,447,789

LASER AMPLIFIER

Vincent Pugliese, Vincennes, and Jean-Claude Farcy, Bris-sous-Forges, both of France, assignors to Compagnie General d'Electricite, Paris, France

Continuation of Ser. No. 244,561, Mar. 17, 1981. This application Mar. 8, 1983, Ser. No. 472,912

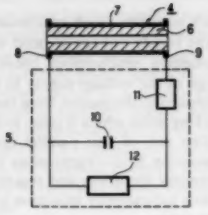
Claims priority, application France, Mar. 21, 1980, 80 06354

Int. Cl.³ H01S *3/09*

U.S. Cl. 330—4.3 **8 Claims**

1. A laser amplifier including a fluid active medium, at least one electric resistance comprising an insulating support and a thin film layer of conductive material deposited on said support, a generator connected to the resistance, said generator comprising means for supplying and electrical discharge current pulse sufficiently high to produce ultra-violet radiation around said resistance of a level capable of exciting the active medium, two portions of said layer being connected to said electrical discharge current pulse supplying means of said generator said electric discharge current pulse being of short

duration so as to hold the damage to the resistance due to the flow of the electrical discharge current pulse to such a small



extent that it is not detrimental to subsequent re-use for subsequent excitation of the active medium.

4,447,790

DISTORTION ELIMINATING CIRCUIT

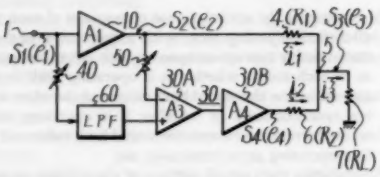
Ryuichi Fukuda; Masami Fujiwara, and Norio Ishiguro, all of Kawasaki, Japan, assignors to Nippon Columbia Kabushikikaisha, Tokyo, Japan

Filed Oct. 8, 1981, Ser. No. 309,578

Claims priority, application Japan, Oct. 13, 1980, 55-145579[U]; Oct. 13, 1980, 55-145580[U]

Int. Cl.³ H03F *1/26, 3/26*

U.S. Cl. 330—149 **7 Claims**



1. A distortion eliminating circuit for use with an amplifier, comprising:

(a) an amplifier for amplifying an input signal;

(b) difference detecting means for detecting a difference between two signals;

(c) first transmitting means for transmitting the input signal to said difference detecting means;

(d) second transmitting means for transmitting an output signal from said amplifier to said difference detecting means;

(e) adding resistor means for adding the outputs from said amplifier and difference detecting means to each other and supplying an added signal to a load; and

(f) first adjusting means for adjusting at least one of said first and second transmitting means and said adding resistor means such that a distortion component contained in the output signal from said difference detecting means is made substantially opposite in phase and substantially the same in level as a distortion component contained in the output signal from said amplifier at the output side of said adding resistor means;

(g) second adjusting means for adjusting at least one of said first and second transmitting means and said adding resistor means such that input signal components contained in the output from said difference detecting means become substantially same as the output signal from said amplifier in phase and level.

4,447,791

POWER SUPPLY CHANGEOVER TYPE POWER AMPLIFIER

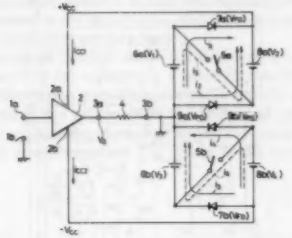
Masao Noro, and Yoshiki Kasahara, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 7, 1982, Ser. No. 386,093

Claims priority, application Japan, Jun. 10, 1981, 56-89360

Int. Cl.³ H03F *3/30*

U.S. Cl. 330—297 **12 Claims**



time delay, and for modulating said voltage controlled oscillator after said time delay.

4,447,793

ROTARY ACTUATORS

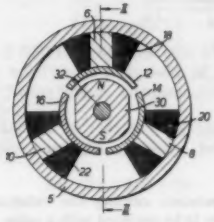
William P. Gray, West Lothian, Scotland, assignor to Racal-Mesl Microwave Limited, Newbridge, Scotland

Filed May 6, 1983, Ser. No. 492,039

Claims priority, application United Kingdom, May 13, 1982, 8213963

Int. Cl.³ H01P 1/10; H02K 33/00

U.S. Cl. 333—106 11 Claims



1. An angular movement actuator, comprising

a first element having two predetermined portions which are magnetised with opposite magnetic polarities, and

a second element providing first, second and third pole means spaced apart by predetermined angular distances,

one said element being at least partially embraced by the other and the two elements being mounted for relative angular movement,

the pole means being magnetisable into a first state in which the first pole means is of North polarity and the second pole means is of South polarity and a second state in which the first pole means is of South polarity and the second pole means is of North polarity, whereby the elements move to a first or second predetermined relative angular position according to the state of magnetisation of the first and second pole means, the third pole means magnetisable so as always to have the same polarity.

4,447,794

AIR BREAK CONTACTOR WITH FORM-FITTED PARTS

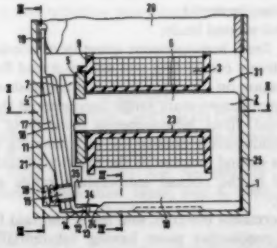
Werner Harbauer; Johann Drexler, both of Schwandorf, and Erwin Flierl, Kümmersbruck, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 10, 1983, Ser. No. 473,997

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1982, 3210447

Int. Cl.³ H01H 67/02

U.S. Cl. 335—128 20 Claims



1. In an air break contactor comprising a cup-shaped housing, a contact carrier and form-fitted contactimplementing parts contained in said housing, said contactimplementing parts including a pivotable armature and a magent assembly stationary with respect to said housing, said magnet assembly having a core member with a first leg engaging a wall of said housing and with a second leg parallel to said first leg and an actuating coil mounted on and at least partially surrounding said second leg, said armature having one end continuously engaging a free end of said first leg at a pivot area and an opposite end engageable with said contact carrier for shifting the carrier upon energization of said coil and consequent pivoting of said armature, the improvement wherein:

the free end of the first leg of the magnet assembly core member is spaced from the housing wall;

the armature comprises a first lamination and at least one second lamination, said first lamination engaging said first leg at the pivot area; and

said first lamination is provided at an end juxtaposed to said first leg with an extension projecting between said housing wall and said free end of said first leg at an angle with respect to said first lamination, said extension having a curved profile proximate to said first lamination.

4,447,795

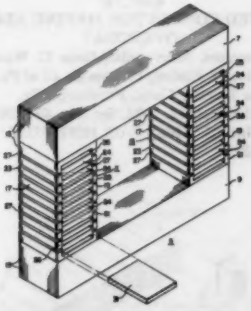
LAMINATED GRID AND WEB MAGNETIC CORES

John Sefko, Monroeville, and Norman M. Pavlik, Plum Borough, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 5, 1981, Ser. No. 260,635

Int. Cl.³ H01F 17/06

U.S. Cl. 336—178 11 Claims



1. A laminated-magnetic core comprising:

(a) spaced core yokes;

(b) core legs disposed between the core yokes;

(c) each core yoke and core leg being comprised of stacked laminations of magnetic material;

(d) each leg including opposite edge walls and opposite web side walls extending between upper and lower core yokes;

(e) the web side walls having opening means comprising a plurality of spaced elongated apertures and edge notches;

(f) the apertures having longitudinal axis disposed transversely to the longitudinal axis of the core legs;

(g) the notches extending from the edge walls and into the web side walls between the apertures; and

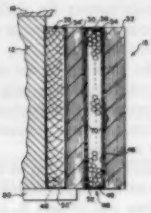
(h) the opening means extending through the laminations of the core legs between the web side walls, whereby linear magnetization characteristics are obtained over the entire hysteresis loop.

4,447,796

SELF-ADJUSTING SPACER

Frank W. Heinrichs, McMurray, Pa., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Apr. 5, 1982, Ser. No. 365,347
Int. Cl.³ H01F 27/08, 27/30
U.S. Cl. 336—60 4 Claims



1. In an electrical apparatus of the type having a first electrical conductor and a second electrical conductor immersed in dielectric fluid, a spacer comprising:

a. a container, defining a first volume and a plurality of flow apertures, interposed between the first conductor and the second conductor; and

b. void filling means disposed within said container, said void filling means comprisiag a plurality of elements whose total volume is generally less than said first volume, said void filling means defining a plurality of interstices;

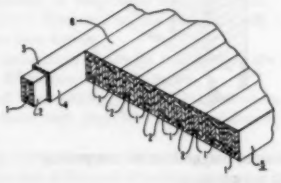
whereby the fluid fills said interstices and the electromagnetic field between said conductors in the vicinity of said container more represents the electromagnetic field which should exist if said void filling means were absent.

4,447,797

INSULATED CONDUCTOR HAVING ADHESIVE OVERCOAT

Howard E. Saunders, Murrysville; Dean C. Westervelt, Bullskin, and Irving N. Elbling, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 12, 1982, Ser. No. 434,100
Int. Cl.³ H01B 7/02; H01F 27/32
U.S. Cl. 336—205 9 Claims



1. An article comprising a conductor coated with a fused and cured resin powder applied insulating coating, over which is a coating of an ultraviolet B-stageable, thermally C-stageable liquid resin.

4,447,798

PROCESSOR SELECT SWITCH

Ira P. Shapiro, Phoenixville, Pa., assignor to Burroughs Corporation, Detroit, Mich.

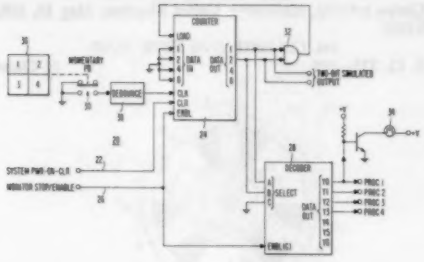
Filed Mar. 3, 1981, Ser. No. 240,142
Int. Cl.³ H03K 21/30
U.S. Cl. 377—55 9 Claims

1. A device for indicating a selected one of a plurality of n sequential states of a selector switch, said device comprising:

input means for initiating the switching of said selector switch;

counter means, responsive to said input means, said counter means for storing a value corresponding to a current state which is one of said plurality of n sequential states; and

load means, responsive to said counter means, said load means for enabling a load operation of said counter means,



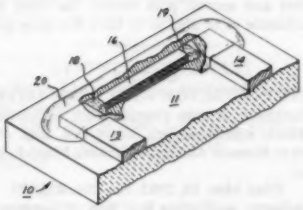
said load operation causing the value stored in said counter means to be replaced with a value corresponding to an initial one of said plurality of n sequential states upon a count of n−1 from said counter means followed by an actuation of said input means; and wherein the output of said counter means provides a coded representation of said current state of the selector switch.

4,447,799

HIGH TEMPERATURE THERMISTOR AND METHOD OF ASSEMBLING THE SAME

Richard O. Carlson, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 30, 1981, Ser. No. 230,163
Int. Cl.³ H01C 7/02
U.S. Cl. 338—22 R 21 Claims



1. A thermistor suitable for use in a temperature range with a maximum temperature exceeding 400° Centigrade, comprising:

(a) thermistor material;

(b) first and second leads;

(c) a first, fired, homogeneous quantity of conductive paste conductively connecting and adhering said first lead to a first location on the exterior of said thermistor material in the normal temperature range encountered thereby; and

(d) a second, fired, homogeneous quantity of conductive paste conductively connecting and adhering said second lead to a second location on the exterior of said thermistor material in the normal temperature range encountered thereby;

(e) said thermistor material, said leads, and said fired quantities of conductive paste having substantially matched thermal expansion coefficients in the normal temperature range encountered thereby;

(f) said leads being impervious to material oxidation in the

environment encountered thereby during assembly and normal operation of the thermistor; and

(g) said fired quantities of conductive paste each having a curing temperature substantially in excess of said maximum temperature, each having a stable conductivity in the temperature range encountered thereby during operation of the thermistor, and each being substantially chemically inert with respect to said thermistor material and to said leads in the temperature range encountered thereby during assembly and normal operation of the thermistor.

4,447,800

OBSTACLE DETECTOR FOR USE IN VEHICLES

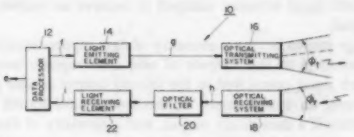
Hideo Kasuya, and Hiroshi Endo, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jul. 22, 1981, Ser. No. 286,184

Claims priority, application Japan, Jul. 25, 1980, 55-105201[U]

Int. Cl.³ G08C 1/00

U.S. Cl. 340—904 **11 Claims**



1. An obstacle detector for use in an automotive vehicle, comprising:

(a) an optical transmitting system for transmitting a light signal against an obstacle likely to be present on the road on which the vehicle with the detector travels, the light signal having a wavelength differing from that of solar radiation present in large quantities at the surface of the earth and longer than that of light radiation transmitted by front glasses of headlights of other vehicles and/or streetlamps, the transmitting system including a light emitting element made of a semiconductor infrared laser, the semiconductor being in the form of a crystal which has the formula $P_{b(1-x)}S_{n(x)}T_{(e)}$ where P_b is lead, S_n is tin, T_e is tellurium, and x is on the order of 0.07; and

(b) an optical receiving system including an optical filter means having a pass band corresponding to the transmitted wavelength for blocking passage of solar radiation present in large quantities at the surface of the earth and for blocking light radiation passed by the front glasses of other sources;

whereby optical signals received by the receiving signal are substantially free of background radiation including solar radiation and radiation generated by artificial sources.

4,447,801

TROUBLE SHOOTING METHOD OF VEHICLES

Yutaka Masuda, Fukuroi, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

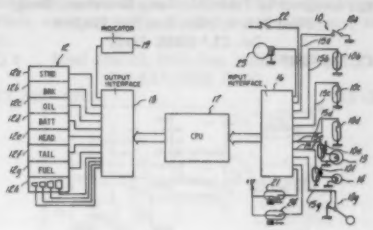
Filed Sep. 4, 1981, Ser. No. 299,508

Claims priority, application Japan, Sep. 6, 1980, 55-123730

Int. Cl.³ B60Q 1/00

U.S. Cl. 340—52 F **14 Claims**

1. The method of monitoring a plurality of vehicle conditions by means of individual warning devices for each of such conditions comprising the steps of simultaneously operating all of said warning devices for a period of time when a main vehicle switch is closed, sensing the starting of the vehicle engine, and sequentially operating each of said warning devices and subsequently deactivating each warning device if the condition monitored is correct.



4,447,802

WARNING LIGHT

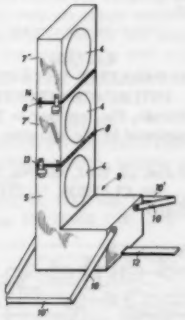
Herbert Böse, Am Dachsbau 9, Neuenhein/Ts, Fed. Rep. of Germany (D-6232)

Filed Jul. 23, 1981, Ser. No. 286,253

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1980, 3028219

Int. Cl.³ E01F 9/00; B60Q 1/00

U.S. Cl. 340—119 **8 Claims**

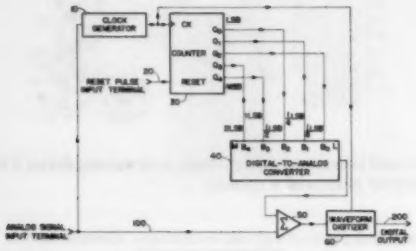


1. A road traffic warning light comprising a block-shaped housing composed of at least two superposed housing elements, a respective joint pivotally interconnecting adjacent ones of the housing elements for enabling the housing elements to be folded, a respective holding element between the adjacent housing elements for enabling the housing elements to be erected to form a column, a warning light signal transmitter mounted on each one of the superposed housing elements, and means for stabilizing a lowest one of the superposed housing elements in an erect position, the stabilizing means comprising a support and the housing elements consisting of a lowest housing element projecting substantially perpendicularly from the support and a superposed one of the housing elements adjacent the lowest housing element, the lowest housing element having an upper rim and a free space being defined between the support and the lowest housing element, the joint pivotally interconnecting the housing elements at a side of the upper rim adjoining the free space, and the superposed housing element having a volume and shape corresponding to the volume and shape of the free space.

4,447,803
OFFSET DIGITAL DITHER GENERATOR

Philip S. Crosby, Portland, and Dale A. Jordan, Aloha, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 9, 1980, Ser. No. 110,566
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 CC 7 Claims



1. A system for converting a repetitive analog input signal to an equivalent digital representation, the system including means for generating a dither signal, means for combining the analog signal with the dither signal, and means for quantizing the resultant combined signal to provide a digital representation thereof, characterized in that

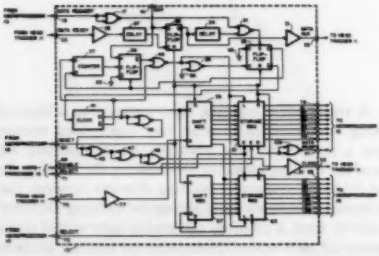
said dither signal generating means generates a repetitive sequence of voltage levels corresponding in magnitude to different fractional and whole multiples of a digital bit produced by said quantizing means, and

different repetitions of said analog input signal are sequentially combined with the different dither voltage levels of said sequence.

4,447,804
SERIAL TO PARALLEL DATA CONVERSION INTERFACE CIRCUIT

John H. Allen, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 22, 1981, Ser. No. 275,564
Int. Cl.³ H03K *13/258*
U.S. Cl. 340—347 DD 13 Claims



1. A serial to parallel data conversion circuit comprising, in combination:

a first input terminal adapted to receive a data ready pulse signal;

a second input terminal adapted to receive a data request pulse signal;

a third input terminal adapted to receive a plurality of data words, each of which has a predetermined number of data bits;

clock generating means having an input, and first and second outputs, for providing at the first output thereof a clock signal and at the second output thereof an inverted clock signal, each of which has a series of uniformly spaced clock pulses;

shift register means having a clock input connected to the first output of said clock generating means, a data input connected to said third input terminal, and a plurality of outputs, adapted for receiving and storing therein, in response to each clock pulse of said clock signal, one bit of each of said plurality of data words;

gating means having a first input connected to said first input terminal, a second input connected to said second input terminal, a third input connected to the second output of said clock generating means, a first output connected to the input of said clock generating means, a second output, and a third output, for providing in response to said data ready pulse signal, a data acknowledge pulse signal, for providing a latch pulse signal, and for activating for a predetermined time period, in response to said inverted clock signal, said clock generating means so as to effect the storage of each of said plurality of data words within said shift register means, with the first of said data words being stored within said shift register means in response to said data ready pulse signal, and with each successive data word being stored within said shift register means in response to said data request pulse signal;

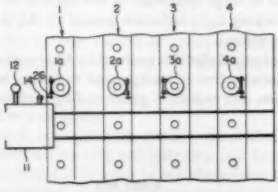
a fourth input terminal adatped to receive an enable pulse signal;

storage means having a plurality of data inputs respectively connected to the outputs of said shift register means, a latch input connected to the second output of said gating means, an enable input connected to said fourth input terminal, a data ready output, and a plurality of data outputs adapted for latching therein, in response to said latch pulse signal, each data word stored within said shift register means, and for transferring to the outputs thereof, in response to said enable pulse signal, the data words stored therein.

4,447,805
APPARATUS FOR MEASURING TEMPERATURE OF COKE OVENS

Yoshihiro Omae; Noboru Okubo; Keiichi Sigyo; Hideo Nakajima; Hiroaki Fukui; Toshio Yamada, and Hideyuki Honda, all of Kitakyushu, Japan, assignors to Mitsubishi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 18, 1982, Ser. No. 349,909
Claims priority, application Japan, Feb. 23, 1981, 56-25266; Nov. 11, 1981, 56-179814; Nov. 26, 1981, 56-188391
Int. Cl.³ G08B *1/08;* C10B *47/00*
U.S. Cl. 340—539 12 Claims



1. Apparatus for measuring temperature of coke ovens which are arranged in an array, each coke oven including a plurality of combustion chambers respectively provided with a plurality of flue nozzles at their tops, said apparatus comprising:

rails disposed above said array and extending in a direction thereof or in a longitudinal direction of said combustion chambers;

a measuring car continuously running on said rails;

a temperature measuring member mounted on said measur-

ing car for receiving thermal radiations emitted by said combustion chambers through said flue nozzles;

radio transmitting means mounted on said measuring car for transmitting data measured by said temperature measuring member as an electric signal; and

radio receiving means located in a remote control room for converting received electric signal into a signal representing measured temperature.

4,447,806

TEST CIRCUIT FOR ELECTRICAL CONTINUITY OF A LOAD CIRCUIT

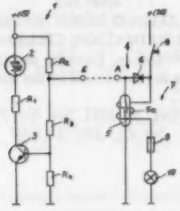
Manfred Gündel; Heinz-Werner Schlamm, and Klaus-Dieter Schmitz, all of Wuppertal, Fed. Rep. of Germany, assignors to Kabelwerke Reinshagen GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 317,739, Nov. 3, 1981. This application Dec. 14, 1981, Ser. No. 330,065

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1980, 3041206

Int. Cl.³ G08B 21/00

U.S. Cl. 340—641 **7 Claims**



1. In a test circuit for testing electrical continuity of an electrical load circuit, said load circuit including a load switch and a load device connected in series in the order named between the first and second terminals of a voltage source, said test circuit being of the type which includes an indicating device having normal and abnormal states, the improvement comprising,

an indicating circuit connected across the terminals of said voltage source and including said indicating device and a first switching means,

said first switching means having an input member for changing the first switching means between conductive and nonconductive states,

a detecting circuit including a second switching means having an input member responsive to current for changing the second switching means between conductive and nonconductive states,

the input member of the first switching means being coupled to the second terminal of the voltage source through said second switching means,

the input member of the first switching means being coupled to said second terminal of the voltage source through a current blocking means and the load device,

the input member of the second switching means being coupled with said load circuit and being operated to change the second switchng means between one and the other of the conductive and nonconductive states in response to current in the load circuit,

said indicating device being in a normal state when there is continuity of said load circuit with said load switch turned off or turned on and being in an abnormal state when there is discontinuity of said load circuit with said load switch turned off or turned on.

4,447,807

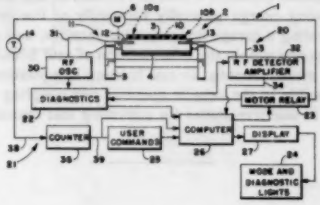
SIGNAL TO NOISE RATIO IMPROVEMENT FOR RIP DETECTORS

Richard G. Klein, Avon Lake, and Robert J. Houck, Akron, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jun. 22, 1981, Ser. No. 275,969

Int. Cl.³ G08B 21/00

U.S. Cl. 340—676 **13 Claims**



1. Conveyor belt rip detector apparatus for monitoring the integrity of a conveyor belt having antenna means for coupling or not coupling signals as an indication of a belt integrity, said antenna means having finite resistance and said conveyor belt and associated apparatus having a finite cross coupling capacitance, comprising: signal generator means for generating an AC signal in a frequency range of from about 25 KHz. to less than about 100 KHz., the frequency of such AC signal being such that the effective impedance of such cross coupling capacitance as a function of such frequency is at least several times greater than that of such antenna means, input capacitance signal coupling means for coupling such AC signal to such antenna means, receiver means responsive to receipt of AC signals for detecting conveyor belt integrity, and output capacitance means for coupling to said receiver means AC signals coupled through such antenna means.

4,447,808

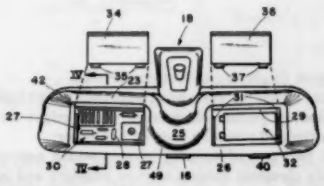
REARVIEW MIRROR TRANSMITTER ASSEMBLY

Konrad H. Marcus, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Sep. 18, 1981, Ser. No. 303,490

Int. Cl.³ H04B 7/00, 1/03

U.S. Cl. 340—696 **7 Claims**



6. A self-contained garage door opening transmitter module for attachment to the rear surface of an interior rearview mirror of a vehicle said rearview mirror including a housing having a rear wall with a mounting post extending therefrom for supporting the rearview mirror in the interior of said vehicle and a front supporting a mirror element, said rear wall of said housing having a predetermined configuration, comprising:

a transmitter housing having a forward wall, a rearward wall, and side walls providing an enclosure, said forward wall having a configuration corresponding at least along the peripheries thereof to the configuration of the rear

wall of said rearview mirror, said transmitter housing being adapted to be secured to the rear wall of said rearview mirror housing and when so secured together said housings give the appearance of a one-piece housing;

said transmitter housing including an integral elongated housing having a central recess dividing said housing into two sections and permitting said housing to be attached to the rear surface of a rearview mirror with the mounting post for said rearview mirror extending through said recess;

a transmitter mounted within one section of said housing for radiating energy generally forwardly of the vehicle for activating a garage door opening receiver, and a battery positioned within the other section of said housing; and

switch means mounted to said housing in a position readily accessible to the vehicle operator and coupling said battery to said transmitter for activating said transmitter.

4,447,809

HIGH RESOLUTION FIGURE DISPLAYING DEVICE UTILIZING PLURAL MEMORIES FOR STORING EDGE DATA OF EVEN AND ODD HORIZONTAL SCANNING LINES

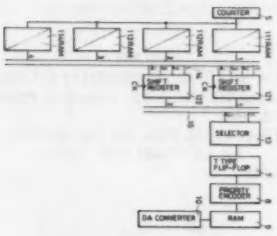
Kazuyuki Kodama, Kokubunji; Takeyuki Endo; Kunihiro Okada, both of Tokyo, and Yasutaka Shibuya, Tachikawa, all of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan

Continuation of Ser. No. 156,799, Jun. 5, 1980. This application Sep. 2, 1982, Ser. No. 414,388

Claims priority, application Japan, Jun. 13, 1979, 54-73585

Int. Cl.³ G09G *1/16*

U.S. Cl. 340—747 **14 Claims**



1. A figure displaying device comprising:

generator means for generating edge data which indicate the positions of picture elements at which edges are present on horizontal scanning lines of a monitor;

at least two sets of memory groups which correspond to picture elements located at even numbers and odd numbers on each horizontal scanning line, respectively, and which store predetermined data in the addresses corresponding to the picture elements at which edges are present;

at least two deriving means for individually deriving data stored in said addresses of said two sets of memory groups corresponding to the picture elements located at the positions of even numbers and odd numbers on each horizontal scanning line;

selection means for alternately selecting the outputs of said deriving means; and

control means for displaying figures on the monitor responsive to the output of said selection means.

4,447,810

DOT AND DASH SEGMENT DISPLAY FOR SIMPLIFIED WRITING OF ARABIAN LANGUAGE

Jean M. Lefebure, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 16, 1981, Ser. No. 321,705

Claims priority, application France, Dec. 2, 1980, 80 25558

Int. Cl.³ G09G *3/00*

U.S. Cl. 340—756 **6 Claims**

1. A dot and dash segment display device for arabic characters with a display matrix formed by the repetition, on a line of writing and without spacing, of a basic pattern, said device comprising a plurality of display elements forming a series of vertical line segments, at least three horizontal line segments with one horizontal segment contacting one end of the vertical segments and at least two horizontal segments dividing the vertical segments into upper, lower and central portions and areas and two dots in each upper and lower area.

4,447,811

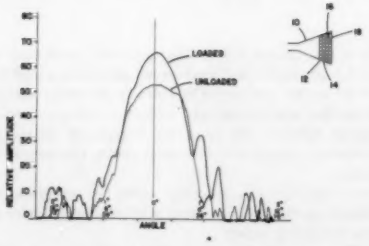
DIELECTRIC LOADED HORN ANTENNAS HAVING IMPROVED RADIATION CHARACTERISTICS

Michael Hamid, Winnipeg, Canada, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 26, 1981, Ser. No. 315,331

Int. Cl.³ H01Q *13/02*

U.S. Cl. 343—783 **3 Claims**



1. A means of improving the axial grain and narrowing the main beam of a microwave radiation system having an aperture antenna comprising:

(a) inserting a first dielectric slab of uniform relative permittivity into said aperture antenna to a predetermined depth in said aperture antenna, said first slab having a uniform thickness in the direction of propagation of said beam and extending completely between all four walls of said aperture antenna;

(b) inserting a second dielectric slab of uniform relative permittivity adjacent said first dielectric slab, said second slab having uniform thickness in the direction of propagation of said beam and extending completely between all said four walls of said aperture antenna;

(c) inserting a third dielectric slab of uniform relative permitivity adjacent said second dielectric slab, said third slab having uniform thickness in the direction of propagation of said beam and extending completely between all said four walls of said aperture antenna; and

(d) inserting a fourth dielectric slab of uniform relative permittivity adjacent said third dielectric slab, said fourth slab having uniform thickness in the direction of propagation of said beam and extending completely between all

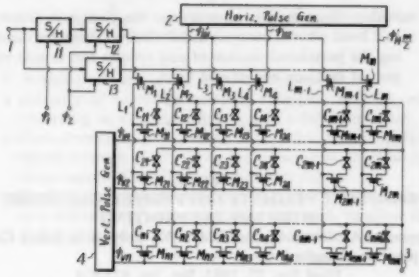
said four walls of said aperture antenna and having the opposite face of said fourth slab flush with the outer dimensions of said aperture antenna, the thickness of all of said dielectric slabs being the same.

4,447,812

LIQUID CRYSTAL MATRIX DISPLAY DEVICE

Mitsuo Soneda, Zama, and Takaji Ohtsu, Hatano, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 3, 1982, Ser. No. 384,560
Claims priority, application Japan, Jun. 4, 1981, 56-86289
Int. Cl.³ G09G *3/18*
U.S. Cl. 340—784 **7 Claims**



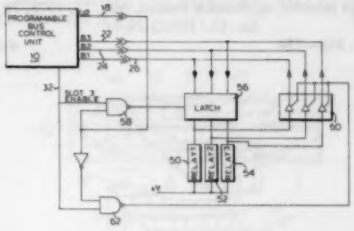
1. A liquid crystal matrix display device comprising a plurality of display elements arranged in X-axis and Y-axis directions as an X-Y matrix pattern of a predetermined number n of rows of said display elements, each such row extending in the X-axis direction and containing a predetermined number m of said display elements arranged in respective columns extending in the Y-axis direction, with each such display element including a liquid crystal cell and a switching element connected therewith to supply a signal charge to the associated liquid crystal cell; input means receiving an input signal to be distributed to said display elements; a plurality of said predetermined number m of first transmitting lines each coupled to the n switching elements of each said column; a plurality of said predetermined number n of second transmitting lines each coupled to the m switching elements of each said row; a plurality of said predetermined number m of input switching devices each having an input electrode coupled to said input means, an output electrode coupled to a respective one of said m first transmitting lines, and a control electrode; first scanning pulse generator means having a predetermined number of outputs providing sequential first scanning pulses for said m input switching elements; and second scanning pulse generator means providing sequential second scanning pulses to said n second transmitting lines; wherein said m first transmitting lines are arranged into groups of a predetermined plurality l of successive such lines, and the input switching elements associated with the first transmitting lines of each such group have their control electrodes coupled together to a respective one of the outputs of said first scanning pulse generator means; and wherein said input means includes time-demultiplexing means having an input receiving said input signal and a plurality l of outputs simultaneously presenting different respective sampled versions of said input signal which represent the video signal at times staggered with respect to one another, with each of said l outputs being coupled to the input electrode of a respective one of the input switching devices of each of said groups.

4,447,813

PROGRAMMABLE BUS FOR THE CONTROL OF ELECTRONIC APPARATUS

Bruce L. O'Pray, New York, N.Y., assignor to Control Resources Corporation, Hackensack, N.J.

Filed Jun. 4, 1982, Ser. No. 385,037
Int. Cl.³ H04Q *9/00*
U.S. Cl. 340—825.1 **5 Claims**



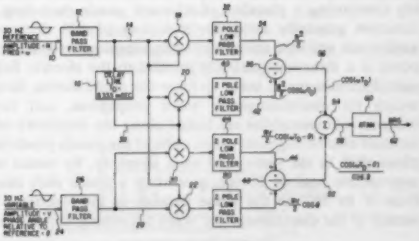
1. An improved bus architecture comprising: a bus formed of a plurality of lines; a programmable bus control unit connected to said bus lines; a plurality of slots along said bus line, each slot being adapted to receive an apparatus for connection with said bus line; and a plurality of slot enabling lines, each enabling line extending from said control unit to one of said slots whereby said enabling lines control access of said apparatus to said bus lines under direction of said control unit so that the function of said bus lines may be redefined as required by said apparatus.

4,447,814

DIGITAL VOR BEARING MEASUREMENT APPARATUS

Jan E. Treise, West Melbourne, Fla., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 7, 1983, Ser. No. 472,682
Int. Cl.³ G01S *1/44*
U.S. Cl. 343—401 **5 Claims**



1. The method of determining bearing angle using reference and variable signals received from a VOR ground station comprising the steps of:

phase shifting the reference signal by approximately 90 degrees;

generating a first signal by multiplying the phase shifted signal by the reference signal and dividing the DC component of the result by the DC component of the reference signal squared;

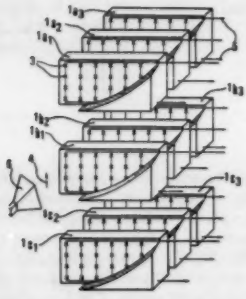
generating a second signal by multiplying the phase shifted signal by the variable signal and dividing the DC component of the product by the DC component of the product of the reference and the variable signals; and

generating the bearing indicative angle by calculating the arctangent of the second signal less the first signal.

4,447,815
LENS FOR ELECTRONIC SCANNING IN THE POLARIZATION PLANE

Claude D. Chekroun, Bures sur Yvette, and Yves C. Michel, Massy, both of France, assignors to Societe d'Etude du Radant, Les Ulis, France

PCT No. PCT/FR80/00159, 371 Date Jun. 1, 1981, 102(e) Date Jun. 1, 1981, PCT Pub. No. WO81/01486, PCT Pub. Date May 28, 1981
PCT Filed Nov. 7, 1980, Ser. No. 270,519
Claims priority, application France, Nov. 13, 1979, 79 27873
Int. Cl.[3] H01Q *19/06*
U.S. Cl. 343—754 6 Claims



1. Electronic scanning device comprising a plurality of dielectric panels each panel having flat networks of conducting wires embedded therein, said wires being capable of being continuous or discontinuous as desired by means of diodes mounted on said wires and said wires being embedded in such fashion that the wires in all the networks are parallel to the electrical field vector of an incident electromagnetic wave emitted by a microwave source, wherein the height of each said panel is less than the dimension of the incident electromagnetic wave and all the diodes in each panel are controlled simultaneously and identically by a single device, said panels being arranged in a plurality of assemblies thereof, each assembly comprising a plurality of adjacent panels extending in a direction generally along the trajectory of said electromagnetic wave and said assemblies being superimposed one on the other in a direction generally parallel to the electric field of said electromagnetic wave to form the entire device through which the electromagnetic wave propagates, and further wherein said assemblies are linked along the trajectory of the incident electromagnetic wave, each of the panels producing a phase shift in the wave, and each assembly, by means of an appropriate control device, providing a phase shift ranging from 0° to 360° in the plane parallel to the electrical field vector of the electromagnetic wave traversing the device.

4,447,816
STIFFENING CLAMP FOR SELF-ERECTING ANTENNA

Miles J. Kurina, Wellesley Hills, and John Thornhill, Tewksbury, both of Mass., assignors to RCA Corporation, New York, N.Y.

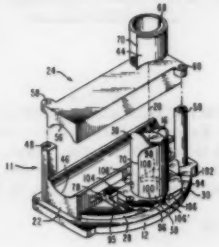
Filed Nov. 25, 1981, Ser. No. 325,046
Int. Cl.[3] H01Q *1/08*
U.S. Cl. 343—877 10 Claims

1. In a self-erecting antenna comprising a resilient band prestressed to assume the shape of an extended tubular rod when unstressed, the rod having a longitudinal axis parallel to the length dimension of the band, and said band being sufficiently resilient to be flattened and spirally wound into a coil, about an axis parallel to the width dimension of the band, the combination therewith comprising:

means for storing said band, wound into a coil;

a support to which one end of said band is secured;

means for releasing said coil whereby it unwinds and assumes the shape of a tubular rod, the rod being secured at said one end of said band to said support; and

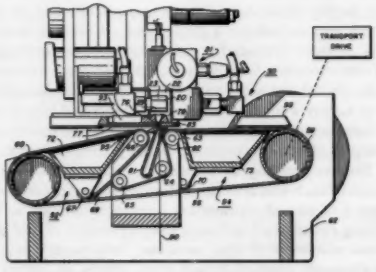


movable clamp means responsive to the change in shape of said band when it assumes its tubular rod shape for clamping the peripheral surface of said tubular rod to said support at said one end of said band.

4,447,817
CONSTANT VELOCITY COPY SHEET TRANSPORT WITH INK JET PRINTING

Raymond A. Naramore, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 27, 1982, Ser. No. 423,874
Int. Cl.[3] G01D *15/18*
U.S. Cl. 346—75 7 Claims



1. A transport apparatus for conveying sheet material to a printing zone whereat a full width, marking device is positioned to permit marking of the material comprising:

a transport belt movable in a path, a plane of which is contiguous with the printing zone and arranged to convey sheet material into marking engagement with the marking device,

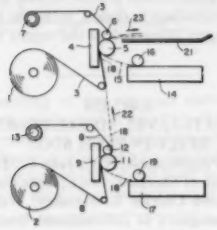
a vacuum plate having a surface generally parallel to said plane between which sheet material is conveyed, said plate being provided with at least one air intake vacuum opening positioned closely adjacent and along the marking device, said plate being operatively associated with a vacuum source and arranged to draw sheet material against said surface and the marking device, and

means for driving said transport belt in said path with sheet material thereon whereby the sheet will be driven through the printing zone and past the marking device as the sheet material is moved along said vacuum plate surface.

4,447,818
MULTICOLOR HEAT-SENSITIVE RECORDING APPARATUS

Masami Kurata, and Fujio Moriguchi, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1982, Ser. No. 349,551
Claims priority, application Japan, Feb. 20, 1981, 56-23137
Int. Cl.³ G01D *15/10, 9/28;* B41J *3/02*
U.S. Cl. 346—76 PH 5 Claims

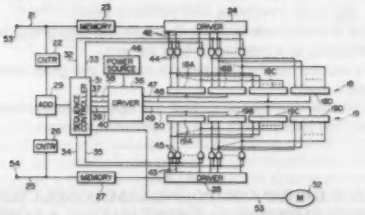


5. A multicolor recording device, comprising:
a plurality of recording sections arranged in series, each recording section recording data in a different color;
a sheet conveying path passing from a first sheet supplying means through all of said recording sections, to allow data to be recorded in all of said different colors;
at least one alternate sheet supply means for supplying sheets to a mid point of said sheet conveying path, to allow data to be recorded in less than all of said colors.

4,447,819
THERMAL RECORDING DEVICE

Haruhiko Moriguchi, and Takashi Ohmori, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 8, 1982, Ser. No. 386,383
Claims priority, application Japan, Jun. 8, 1981, 56-86764
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—76 PH 4 Claims

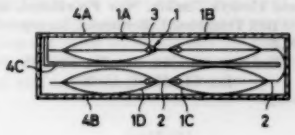


1. A thermal recording device comprising:
at least two thermal heads of heat generating unit arrays arranged in parallel with each other so that data are thermally recorded on a recording sheet, each of said thermal heads or heat generating unit arrays being divided into a plurality of blocks, each of said blocks comprising a predetermined number of heat generating units;
a record signal counter means associated with each of said thermal heads or heating generating unit arrays for counting the number of recording signals for printing images supplied to said heads or arrays;
means for adding the counts of said counters at preselected times to obtain the total count value contained in all of said counters; and
drive control means responsive to the counts in said record signal counter means for determining a number of blocks to be simultaneously driven to perform recording without exceeding the capacity of a power source of said device.

4,447,820
INK SUPPLYING MECHANISM

Koji Terasawa, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 28, 1982, Ser. No. 383,101
Claims priority, application Japan, Jun. 8, 1981, 56-86873
Int. Cl.³ G01D *15/18;* B41F *31/00;* B41J *27/18*
U.S. Cl. 346—140 R 7 Claims

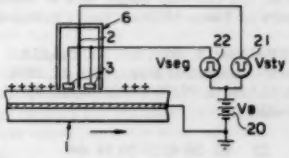


1. An ink supplying mechanism, comprising:
a plurality of ink containers each having an ink outlet tube for supplying ink out and having a bag structure made of a flexible film, said plurality of ink containers containing an ink of a different color;
a cassette case for accommodating said plurality of ink containers;
a guide member for guiding said cassette case to a loading position and for permitting the loading of said cassette case only when said cassette case is in a proper orientation; and
a plurality of connecting tubes each connected to a corresponding one of said ink outlet tubes of said plurality of ink containers when said cassette case is at said loading position.

4,447,821
METHOD AND APPARATUS OF ELECTROSTATIC RECORDING

Kazuhiro Yuasa, Zama, and Noboru Furukawa, Atsugi, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jul. 16, 1982, Ser. No. 399,005
Claims priority, application Japan, Jul. 17, 1981, 56-112001
Int. Cl.³ G01D *15/06*
U.S. Cl. 346—154 8 Claims



1. An electrostatic recording apparatus for forming an electrostatic latent image on the surface of a uniformly charged recording medium which is moved relative to said apparatus and includes a surface dielectric layer formed on an electrically conductive layer which is connected to a reference potential, said apparatus comprising:
a plurality of recording styluses arranged in the form of an array extending in the direction perpendicular to the direction of relative motion between said apparatus and said medium;
auxiliary electrodes means disposed in the vicinity of said recording styluses;
means for applying recording signals of the polarity opposite

to that of the uniform charges of said recording medium to said recording styluses;

means for applying a predetermined voltage of the polarity same as that of the uniform charges of said recording medium to said auxiliary electrode means; and

means for applying a bias voltage of the polarity same as that of the uniform charges of said recording medium to said plurality of recording styluses and said auxiliary electrode means.

4,447,822

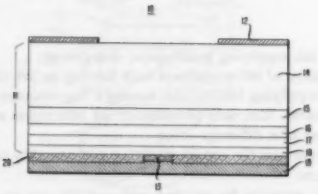
LIGHT EMITTING DIODE

Aland K. Chin, Berkeley Heights; Michael A. DiGiuseppe, Succasunna, and Henryk Temkin, New Providence, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 21, 1981, Ser. No. 304,175

Int. Cl.³ H01L *33/00*

U.S. Cl. 357—17 **7 Claims**



1. A light emitting diode designed for incoherent emission at about 1.3 microns in a direction essentially normal to the front face of the diode comprising a semiconductive crystal having successive contiguous layers, including a front layer of indium phosphide, a first intermediate active layer of indium gallium arsenide phosphide, a second intermediate layer of indium phosphide, and a back layer of indium gallium arsenide, a first electrode making low resistance electrical connection to the front layer, and a second electrode making low resistance electrical connection to the back layer, the crystal being free of any layer substantially absorptive of the emission at about 1.3 microns between the active layer and the front layer where the emission exits.

4,447,823

SOS P—N JUNCTION DEVICE WITH A THICK OXIDE WIRING INSULATION LAYER

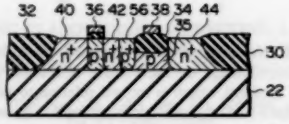
Kenji Maeguchi, and Hiroyuki Tango, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 5, 1981, Ser. No. 240,850

Claims priority, application Japan, Mar. 12, 1980, 55-31291

Int. Cl.³ H01L *29/78, 27/02, 27/12, 45/00*

U.S. Cl. 357—23 **13 Claims**



1. A semiconductor device comprising:

an insulation body;

a silicon layer formed on the insulation body;

a first semiconductor region of a first conductivity type formed in a part of the silicon layer;

a second semiconductor region formed in a part of said silicon layer adjacent to the first semiconductor region and cooperating with the first semiconductor region to form a pn junction element, said second semiconductor region having a second conductivity type opposite to that of the first semiconductor region, and said first semiconductor region having an upper surface lying below the upper surface of said silicon layer;

a third semiconductor region of first conductivity type formed in a part of said silicon layer separated from the second semiconductor region and adjacent to the first semiconductor region and having a higher impurity concentration than that of the first semiconductor region; and

an insulation region formed at least on said upper surface of the first semiconductor region with the bottom of said insulation region lying below the upper surface of said silicon layer.

4,447,824

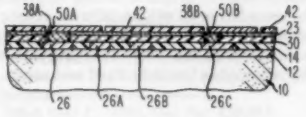
PLANAR MULTI-LEVEL METAL PROCESS WITH BUILT-IN ETCH STOP

Joseph S. Logan, Poughkeepsie, N.Y.; John L. Mauer, IV; Laura B. Rothman, both of Sherman, Conn.; Geraldine C. Schwartz, Poughkeepsie, and Charles L. Standley, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 179,145, Aug. 18, 1980, Pat. No. 4,367,119. This application Sep. 10, 1982, Ser. No. 416,437

Int. Cl.³ H01L *43/48, 29/34, 29/44, 29/52*

U.S. Cl. 357—71 **5 Claims**



1. In an integrated circuit package, a substrate having a conductive interconnected pattern on a surface thereof, a superposed conductive structure comprising:

(A) a composite layered structure on said substrate comprising

(a) a lower layer of an electrically insulating organic polymer overlying said surface and said pattern and

(b) a covering oxygen plasma resistant inorganic insulating layer overlying said polymer layer,

(B) at least one via opening through said composite layered structure to a portion of said pattern,

(C) a second conductive pattern on said inorganic insulating layer, and

(D) conductive means in said via opening interconnecting the first said pattern and said second pattern.

4,447,825

III–V GROUP COMPOUND SEMICONDUCTOR LIGHT-EMITTING ELEMENT HAVING A DOPED TANTALUM BARRIER LAYER

Yasuhisa Oana, Yokohama; Nobuaki Yasuda, Zushi; Masato Yamashita, Yokohama, and Norio Ozawa, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 2, 1981, Ser. No. 230,679

Claims priority, application Japan, Feb. 28, 1980, 55-23386; Feb. 28, 1980, 55-23387; Feb. 28, 1980, 55-23391

Int. Cl.³ H01L *23/48, 23/28, 29/46, 29/62*

U.S. Cl. 357—71 **5 Claims**

1. A light-emitting element comprising:

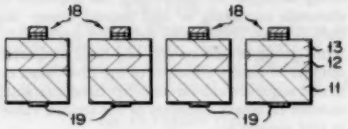
a III–V Group compound semiconductor body having a p-n junction and including a p-type layer involved in forming said p-n junction; and

a multi-layer electrode mounted on the p-type layer; said electrode including

a first layer formed of a gold alloy containing a small amount

of a metal selected from the group consisting of beryllium and zinc; said first layer being formed in direct contact with the p-type layer;

a second layer formed on the first layer and made of tantalum doped with at least one dopant selected from the



group consisting of the elements carbon, nitrogen and oxygen, and a mixture of at least two of said elements, said elements present in an amount between 0.5–2.0, 0.6–1.2 and 0.8–2.0 atomic %, respectively; and

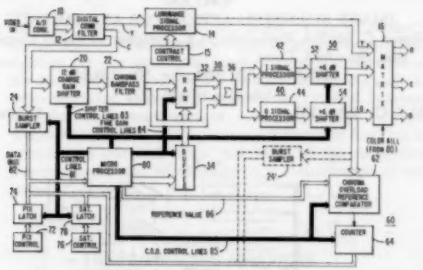
a third layer formed on the second layer and made of a metal selected from the group consisting of gold and aluminum.

4,447,826

DIGITAL TELEVISION RECEIVER AUTOMATIC CHROMA CONTROL SYSTEM

Henry G. Lewis, Jr., Hamilton Square, N.J., and Steven M. Eliscu, Troy, N.Y., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 18, 1982, Ser. No. 359,433
Int. Cl.³ H04N *9/535*
U.S. Cl. 358—27 **15 Claims**



4. In a television receiver, including a source of digital color information signals having a burst signal component, and a source of color control signals representing a level of amplification or attenuation to be applied to said digital color information signals, a chroma signal gain control system comprising:

means, responsive to said digital color information signals, for producing a signal indicative of the level of said burst signal component;

calculating means, responsive to said burst level indicating signal and said color control signals, for calculating the total gain required to be applied to said digital color information signals and for producing gain control signals representative of said total gain; and

controlled digital chroma gain circuitry having an input coupled to receive said digital color information signals and an output at which digital color information signals modified by a gain factor are produced, said circuitry including a controllable signal shifter having a control input coupled to said calculating means and responsive to said gain control signals for adjusting the gain applied to said color information signals in increments which are multiples of 6 dB, and a fine gain block, coupled in series with said signal shifter and having a control input coupled to said calculating means and responsive to said gain control signals for adjusting the gain applied to said color information signals in increments over a range of up to approximately 6 dB, wherein said fine gain block comprises:

a random access memory having an address input coupled to receive said color information signals from said coarse gain block, an output, and containing data words representative of the product of said color information signals and a gain factor; and

an adder having a first input coupled to the output of said random access memory, a second input coupled to receive said color information signals from said signal shifter, and an output at which said digital color information signals modified by a gain factor are produced; and

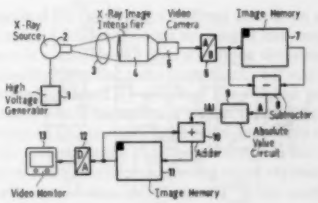
wherein said calculating means apportions said total gain between said signal shifter and said fine gain block so as to modify the level of said color information signals in accordance with said total gain requirement.

4,447,827

X-RAY DIAGNOSTIC INSTALLATION

Mircea Alexandrescu, Braeuningshof, and Joerg Haendle, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengeselschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 17, 1982, Ser. No. 378,785
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1981, 3124584
Int. Cl.³ H04N *7/18*
U.S. Cl. 358—111 **3 Claims**



1. An X-ray diagnostic installation comprising a television pickup system, a first image memory, a difference stage for providing subtraction images through difference formation from the stored and the current video signals, and a monitor, wherein an adder is connected with the output of the difference stage, and a second image memory is connected with the output of the adder so that, in the second image memory, the image point data from the difference stage is summed up, and wherein the output signal of the second image memory is supplied to the monitor, characterized in that circuit means comprising said difference stage, and disposed between the first image memory and the adder, is so designed that it forms the absolute values |A| of the image point data from the difference stage.

4,447,828

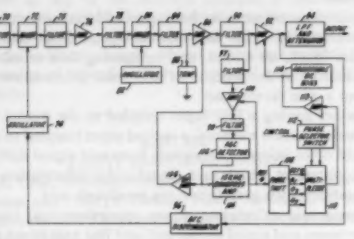
PHASE CHANGE DYNAMIC SCRAMBLING

Pieter den Toonder, Dordrecht, Netherlands, assignor to Oak Industries Inc., Rancho Bernardo, Calif.

Filed Feb. 25, 1982, Ser. No. 352,356
Int. Cl.³ H04N *7/16*; H04K *1/02*
U.S. Cl. 358—118 **11 Claims**

1. Means for coding video signals by the application of one of a plurality of available scrambling signals, which scrambling signals have a common frequency, but differ in phase, including means for comparing the brightness level during a predetermined time period of the video signal with the brightness

level of the video signal over the succeeding predetermined time period, and means for changing from one scrambling



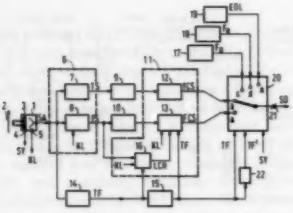
signal to another if the difference in brightness levels between successive predetermined time periods exceeds a given value.

4,447,829

FACSIMILE TRANSMISSION ARRANGEMENT

Raymond G. G. Schayes; Pol A. G. J. Gustin; Robert Bodart, and Michel F. D. J. Berck, all of Brussels, Belgium, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jun. 14, 1982, Ser. No. 387,917
Claims priority, application Belgium, Aug. 18, 1981, 205695
Int. Cl.³ H04N *1/00*
U.S. Cl. 358—260 **1 Claim**



1. Facsimile transmission arrangement for transmitting a document which is divided into document lines, comprising:

A. a transmitter which incorporates:

(A.a.) a reading arrangement for converting a document line into an analog line signal;

(A.b.) a first coding arrangement for converting the analog line signals into a first and a second binary line signal, each consisting of a sequence of binary elements which have a first or a second value;

(A.c.) a second coding arrangement for coding the first and the second binary line signal;

(A.d.) a transmitter output;

(A.e.) a selection circuit for applying selected portions of the first and of the second line signal in coded form to the transmitter output for generating a transmitter output line signal;

B. a receiver incorporating:

(B.a.) a receiver input for receiving the transmitter output line signal;

(B.b.) a decoding arrangement coupled to the receiver input and arranged for decoding the received transmitter output line signal;

(B.c.) a reproducing arrangement coupled to the output of the decoding arrangement

characterized in that:

(A.f.) the second coding arrangement incorporates:

(A.f..a.) a luminance change detector which is coupled to the first coding arrangement and is arranged to produce a detector signal if the luminance of the document line has changed by at least a predetermined value;

(A.f.b.) a first and a second auxiliary coding arrangement to which the first and the second binary line signal, respectively is applied, the second auxiliary coding arrangement being controlled by the detector signal and being arranged for converting the sequence of binary elements occurring in said second binary line signal between two consecutive detection signals into a codeword group which on the one hand characterizes the number of binary elements of the first value, occurring in that sequence and on the other hand characterizes the number of binary elements of the second value present in said sequence;

(B.d.) the decoding arrangement incorporates:

(B.d.a.) a first and a second auxiliary decoding arrangement which are each coupled by means of an input to the receiver input and produce a first and a second binary auxiliary line signal, respectively, the second auxiliary decoding arrangement being arranged for converting each received code word group into a sequence of binary elements which comprise a number of elements which are characterized by the group and have the first value, and a number of elements of the second value which are characterized by said group, in which sequence the elements having the first value and the elements having the second value alternate regularly;

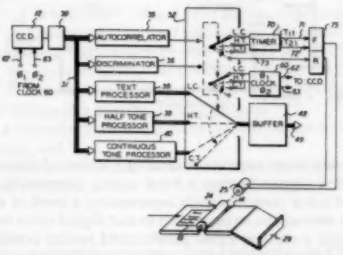
(B.d.b.) a reproducing-selection circuit for applying selected portions of the first and selected portions of the second binary auxiliary line signal to the reproducing arrangement.

4,447,830

IMAGE SCANNING APPARATUS AND METHOD

James C. Stoffel, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 10, 1981, Ser. No. 300,845
Int. Cl.³ H04M *7/12*
U.S. Cl. 358—283 **11 Claims**



1. Raster scanning apparatus for scanning an image to produce pixels representative of said image, comprising in combination:

(a) first image processing means for processing at least line copy images;

(b) second image processing means for processing at least one other image type;

(c) control means for operating said scanning apparatus at high speed to scan said image while actuating said first image processing means to process the pixels produced on the assumption that said image comprises at least line copy; and

(d) image monitoring means for monitoring the content of said image while said image is being scanned at high speed to detect said other image type;

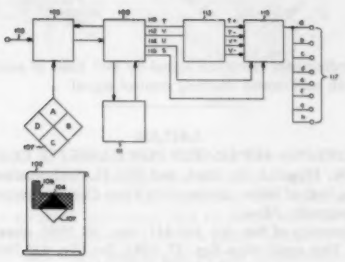
said control means operating said scanning apparatus to scan said image at reduced speed in response to detection of said

other image type while actuating said second image processing means to process the pixels produced by scanning said image at said reduced speed.

4,447,831
METHOD AND APPARATUS FOR ENCODING GRAPHICS

David E. Adsett, Charlton Kings, England, assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Apr. 22, 1982, Ser. No. 370,899
Claims priority, application United Kingdom, Jul. 24, 1981, 8122250
Int. Cl.³ H04N 1/40
U.S. Cl. 358—283 18 Claims

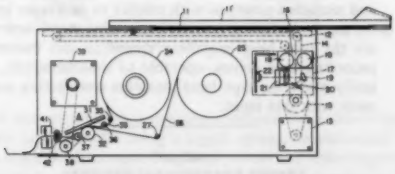


1. A method of encoding the information in a scanned original comprising the steps of:
producing signals indicative of the information in said original;
quantizing said signals according to the values of elements within a stored pattern, for at least a part of said original;
weighting the said quantized signals for separate subareas of the said pattern by combining the said quantized signals to form weighted values representing the original information for each said subarea and combining the said weighted values according to a predetermined function to produce an encoded signal indicative of the modulated distribution of said information over said subareas of said pattern.

4,447,832
REPRODUCING MACHINE

Masami Kurata; Fujio Moriguchi; Toshiharu Inui, and Takashi Ohmori, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1981, Ser. No. 329,467
Claims priority, application Japan, Dec. 10, 1980, 55-174073
Int. Cl.³ H04N 1/22
U.S. Cl. 358—296 23 Claims

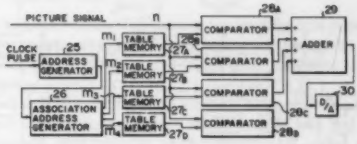


1. A thermal recording type copying machine, comprising:
a platen for arranging an original thereon said original having image information thereon;
a stationary read unit for reading the image information of the original during movement of said platen and for converting the read image into electrical picture signals;
a stationary thermal recording head having heating elements for generating heat in accordance with said electrical picture signals;
an ink donor member stored in a first source;
a continuous recording paper web stored in a second source;
conveying means for conveying said ink donor member and said recording paper web in juxtaposition to each other from said first and second sources, while being in close contact under pressure, past said heating elements of said thermal recording head whereby an image of said original is recorded on said recording paper; and
means for discharging said juxtaposed recorded paper and ink donor member from said machine.

4,447,833
METHOD FOR PRODUCING A HALFTONE PLATE

Tetsuo Sano, and Takashi Sakamoto, both of Kyoto, Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Japan

Filed Dec. 31, 1981, Ser. No. 336,309
Claims priority, application Japan, Jan. 21, 1981, 56-6307
Int. Cl.³ H04N 1/22
U.S. Cl. 358—298 6 Claims



1. A method for producing a halftone plate from an original picture having a continuous tone by using at least one exposure light beam of a smaller size than a halftone dot area, which is independently controlled to be turned on or off according to a picture signal obtained by scanning the original picture, the improvement which comprises a step of controlling the luminous energy of the exposure light beam depending on a reference value corresponding to the picture signal, and a position signal value which is varied depending on an exposure position in the halftone dot area to be exposed by the exposure light beam, wherein the control of the luminous energy of the exposure light beam is performed depending on the sum of the reference value and the position signal value.

4,447,834
REPRODUCING APPARATUS FOR REPRODUCING A ROTARY RECORDING MEDIUM RECORDED WITH A COLOR VIDEO SIGNAL

Hiroyuki Sugiyama, Isehara, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 3, 1982, Ser. No. 345,326
Claims priority, application Japan, Feb. 6, 1981, 56-15677
Int. Cl.³ H04N 9/493
U.S. Cl. 358—310 5 Claims

1. A reproducing apparatus comprising:
rotating means for rotating a rotary recording medium so that a horizontal scanning frequency of a video signal reproduced from any one of an NTSC rotary recording medium recorded with an NTSC system color video signal, a PAL rotary recording medium recorded with a PAL system color video signal, and a SECAM rotary recording medium recorded with a SECAM system color video signal, becomes equal to a horizontal scanning frequency of the PAL or SECAM system color video signal;
carrier chrominance signal separating means for separating a carrier chrominance signal from a color video signal reproduced from the rotary recording medium;
luminance signal separating means for separating a luminance signal from said reproduced color video signal;
a demodulating circuit for demodulating said separated

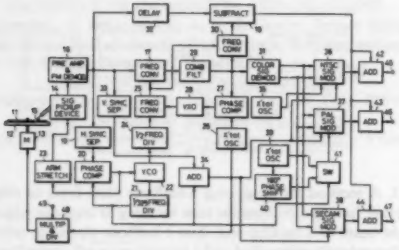
carrier chrominance signal into two color difference signals;

reference signal producing means for producing reference signals having first and second predetermined frequencies;

first modulating means supplied with the reference signal from said reference signal producing means having the first predetermined frequency as a chrominance subcarrier, for modulating this reference signal by the color difference signals from said demodulating circuit, to obtain an artificial NTSC system chrominance signal;

first adding means for adding an output signal of said first modulating means and said separated luminance signal, to obtain an artificial NTSC system color video signal;

second modulating means supplied with the reference signal from said reference signal producing means having the second predetermined frequency as a chrominance subcarrier, for modulating this reference signal by the color difference signals from said demodulating, to obtain a PAL system chrominance signal or an artificial PAL system chrominance signal;



second adding means for adding output signal of said second modulating means and said separated luminance signal, to obtain a PAL system color video signal or an artificial PAL system color video signal;

horizontal synchronizing signal separating means for separating a horizontal synchronizing signal from said reproduced color video signal;

third modulating means for forming a line-sequential signal from the color difference signals from said demodulating circuit by using the horizontal synchronizing signal or a horizontal scanning frequency signal formed in response to the horizontal synchronizing signal, to obtain a SECAM system chrominance signal or an artificial SECAM system chrominance signal; and

third adding means for adding an output signal of said third modulating means and said separated luminance signal, to obtain a SECAM system color video signal or an artificial SECAM system color video signal.

4,447,835

METHOD AND APPARATUS FOR SINGLE FRAME RECORDING ON VIDEO TAPE

Grant M. Smith, Menlo Park, Calif., assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 11, 1982, Ser. No. 338,360
Int. Cl.³ H04N *5/78*; G11B *21/02*
U.S. Cl. 360—10.2 **11 Claims**

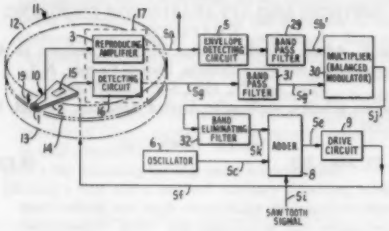
1. A method for controlling a video tape recorder/player, of the type having a movable recording head operating in response to a tracking control signal, to record an electrical signal on a stationary magnetic tape, a portion of said tape having a pre-recorded signal, said method comprising the steps of:

deriving a tracking control signal based upon the playback of the prerecorded signal while the portion is stationary;

storing said tracking control signal;

advancing said tape to a location where said electrical signal is to be recorded;

stopping said tape; and



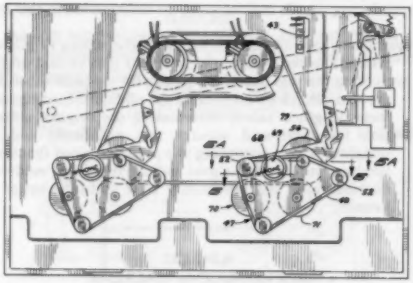
recording said electrical signal by said head in accordance with said stored tracking control signal.

4,447,836

RECORDING APPARATUS FOR CASSETTE COPYING

Dean W. Flygstad, St. Paul, and Bill H. Wehrmacher, Prior Lake, both of Minn., assignors to Telex Communications, Inc., Minneapolis, Minn.

Continuation of Ser. No. 144,441, Apr. 28, 1980, abandoned. This application Sep. 27, 1982, Ser. No. 424,788
Int. Cl.³ G11B *5/86, 15/18*
U.S. Cl. 360—15 **17 Claims**



1. In tape rerecording apparatus of the class including at least one reversible master tape drive and at least one reversible recording tape drive, each of said drives including a moveable tape head, the combination comprising:

moveable tape head mounting means, adapated to receive a tape head, disposed adjacent to a master and recording tape in said drives and operable between tape engaging and retracted positions with respect to said tape; and

drive means, including resilient connecting means intermediate the tape head mounting means in said master and recording tape drives, operable to simultaneously, resiliently move the tape head into data transferring engagement with said tapes.

4,447,837

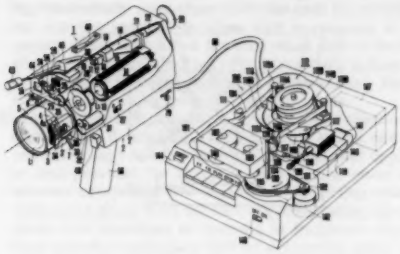
VIDEO RECORDING SYSTEM

Noritsugu Hirata; Hiroyuki Takimoto, and Masaya Maeda, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 235,701, Feb. 18, 1981, abandoned. This application Dec. 7, 1982, Ser. No. 447,608
Int. Cl.³ G11B *1/04, 15/00, 31/00*; H04N *1/22*
U.S. Cl. 360—33.1 **39 Claims**

1. A video recording system comprising a video camera

including image pick up means for forming an image of an object to be recorded and providing corresponding video signals; a video recorder including recording means for recording the video signals on a tape; and coupling means for operatively connecting said video camera to said video recorder including a selected one of a cable and means for detachably mounting said video camera on said video recorder; wherein



said camera is provided with first and second switches arranged to be operated in sequence for controlling an operating state of said recorder and said camera so that when said first switch is actuated, said image pick up means starts to operate and said recording means is set in a partly operative stand-by state, and then when said second switch is actuated, said recording means is fully operative to start a recording operation.

4,447,838

CASSETTE LOADING/UNLOADING APPARATUS FOR CASSETTE TAPE RECORDER

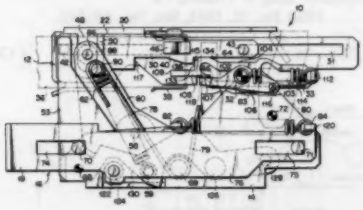
Toshikazu Kato, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1982, Ser. No. 348,330

Claims priority, application Japan, Feb. 24, 1981, 56-24928[U]

Int. Cl.³ G11B *15/00*

U.S. Cl. 360—96.5 **5 Claims**



1. A cassette loading/unloading apparatus for a slot-in type cassette tape recorder using a toggle spring, characterized in that a slider holds a cassette inserted therein and slides together therewith in a cassette holder, and that a spring member to be charged with a biasing force as the slider slides at cassette insertion is provided separately from the toggle spring so that the charged biasing force may act as a resisting force on the slider, said spring member applying the resisting force to the slider before the slider passes the neutral point of the toggle spring, and being prevented from applying the resisting force to the slider after the slider passes the neutral point.

4,447,839

MAGNETORESISTANT TRANSDUCER

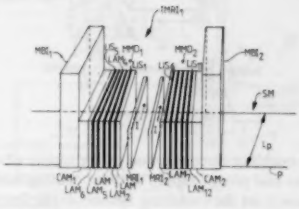
Jacques Desserre, Rambouillet, and Michel Helle, Marcq, both of France, assignors to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France

Filed Oct. 26, 1981, Ser. No. 315,027

Claims priority, application France, Oct. 29, 1980, 80 23012

Int. Cl.³ G11B *5/12, 5/30, 21/10*; G01R *33/12*

U.S. Cl. 360—113 **9 Claims**



1. A magnetoresistant transducer for reading data present in a magnetic area of a plurality of successive magnetic areas distributed along a track of a multi-track magnetic carrier, comprising:

at least one magnetoresistant element adapted to be aligned with said track opposite to said magnetic area and to be disposed perpendicular to the direction of travel of the carrier, the element adapted to be traversed by a current flowing in the direction of its length which current generates a magnetic field;

first and second magnetic screening means disposed at opposite sides of the element for intercepting magnetic flux generated by magnetic areas which enflank the magnetic area opposite which the element is situated; and

first and second deflection means respectively located between said element and said first and second magnetic screening means for deflecting the magnetic field to minimize the creation of magnetic charges at said first and second screening means by said magnetic field and to minimize thereby the intensity at said element of magnetic return fields created by such magnetic charges.

4,447,840

2-SPEED MAGNETIC-TAPE CASSETTE APPARATUS

Georges M. A. Mignolet, and Gilbert E. Mestdagh, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 26, 1981, Ser. No. 314,947

Claims priority, application Netherlands, Apr. 7, 1981, 8101695

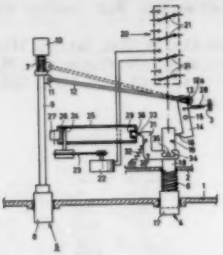
Int. Cl.³ G11B *5/00, 5/08, 5/54*

U.S. Cl. 360—137 **11 Claims**

1. A magnetic tape cassette apparatus comprising an electrical power supply, a power switch for switching the power supply on and off, a tape drive energized by said power supply, a capstan for the tape drive, and a speed switching element which is switchable between a first and a second position, for switching the capstan drive to a first and a second speed respectively, characterized by comprising

switching means arranged between the power switch and the switching element for setting said switching element

to the first position in response to said power switch being switched off and then on again, and



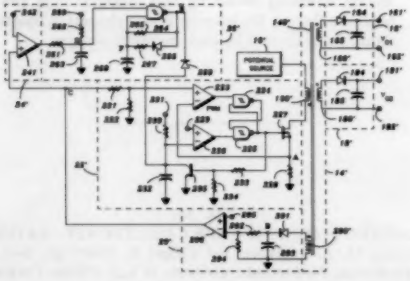
means for enabling disconnection of the supply of electrical power to said power supply without causing said switching means to set the switching element to the first position.

4,447,841

OVERCURRENT PROTECTION CIRCUIT FOR A MULTIPLE OUTPUT SWITCHING POWER SUPPLY AND METHOD THEREFOR

Stephen L. Kent, Chandler, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Jun. 30, 1982, Ser. No. 393,564
Int. Cl.³ H02H 7/122
U.S. Cl. 361—18 **8 Claims**



1. An overcurrent protection circuit for use with a switching power supply having a voltage source coupled to a first terminal of a primary winding of a transformer, having a master oscillator coupled to a second terminal of the primary winding, having at least one output coupled to a first secondary winding of the transformer, and having at least a second secondary winding in the transformer, the overcurent circuit comprisifg:

an error detection circuit for detecting an undervoltage in the second secondary winding, said error detection circuit being coupled to the second secondary winding of the transformer and coupled to the master oscillator; and

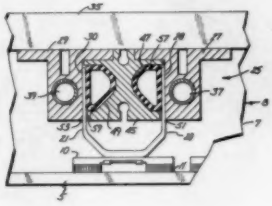
a low frequency oscillator for periodically disabling the master oscillator, said low frequency oscillator being coupled to said error detection circuit and to the master oscillator.

4,447,842

FINNED HEAT EXCHANGERS FOR ELECTRONIC CHIPS AND COOLING ASSEMBLY

William C. Berg, Stillwater, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Jun. 1, 1982, Ser. No. 383,887
Int. Cl.³ H05K 7/20
U.S. Cl. 361—386 **9 Claims**



1. A cooling assembly including an electronic chip, comprising:

a frame;

a means supporting said chip, said chip supporting means being supported by said frame;

a cooling member supported by said frame;

a heat exchange member operably secured to said chip;

an expansible conduit, and

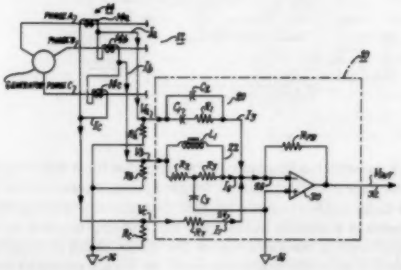
a means supporting said expansible conduit, said expansible conduit supporting means being supported by said frame, said expansible conduit having an expanded condition and a collapsed condition, and a means selectively converting said expansible conduit between said expanded and said collapsed conditions, said heat exchange member being positioned between said expansible conduit and said cooling member, said expansible conduit contacting said heat exchange member in said expanded condition and forcing said heat exchange member into contact with said cooling member so that said chip is cooled by said cooling member.

4,447,843

NEGATIVE SEQUENCE NETWORK HAVING A FREQUENCY COMPENSATED FILTER

William A. Massey, Mt. Holly, N.J., assignor to General Electric Company, King of Prussia, Pa.

Filed Jul. 21, 1982, Ser. No. 400,541
Int. Cl.³ H02H 3/26, 3/34
U.S. Cl. 361—76 **4 Claims**



1. A sequence network adapted to be coupled to each phase of a three phase transmission line by coupling means which develops three signals A, B, and C respectively representative in magnitude and phase of the transmission line currents or of

the transmission line voltages, said sequence network being adapted to detect one phase sequence component and reject another phase sequence component of the transmission line currents or voltages, said sequence network having an operating frequency equal to the rated frequency of the transmission line and comprising:

(a) a first phase shift network having applied thereto said signal A and developing a first output signal, said first phase shift network comprising two legs each contributing substantially equal phase shifts but each leg contributing opposite variation in phase shift in response to frequency changes such that the total phase shift of the first phase shift network does not vary substantially in response to frequency changes within a predetermined limited range encompassing said operating frequency,

(b) a second phase shift network having applied thereto said signal B and developing a second output signal, said second phase shift network providing a phase shift opposite to that provided for signal A, said second phase shift network comprising two legs each contributing substantially equal phase shifts but each leg contributing opposite phase shift variations in response to frequency changes such that the total phase shift of the second phase shift network does not vary substantially in response to frequency changes within said predetermined limited range,

(c) first means for summing said first and second output signals so as to obtain a resultant signal that is representative of the vector sum of said first and second output signals,

(d) an additional network with no substantial phase shift properties having applied thereto said signal C for developing a third output signal in phase with signal C and having a magnitude equal to said resultant signal for the particular phase sequence component to be rejected, and

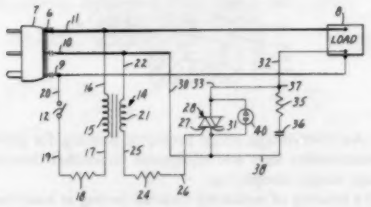
(e) means for summing said third output signal with said resultant signal and developing a fourth output signal representative of the particular phase sequence component to be detected.

4,447,844

ELECTRICAL SAFETY SWITCH FOR ELECTRICAL APPLIANCES

George W. Schossow, 2316 Lilac La., and George P. Stallings, 2327 Mayfair Ave., both of White Bear Lake, Minn. 55110

Filed Feb. 16, 1982, Ser. No. 349,011
Int. Cl.³ H02H 3/14
U.S. Cl. 361—77 **5 Claims**



1. An electrical safety switch adapted for incorporation in an electrical appliance having a three-wire cord comprising

an on/off switch connected directly to the ground line of the cord and disposed in series with a resistor and the primary coil of a transformer, which transformer is connected between the resistor and the B+ line of the cord leading to the appliance,

a triac connected between the load of the appliance and the neutral line with the gate triggering the triac being connected to the transformer secondary coil to be energized thereby upon a current being present through the on/off switch, and

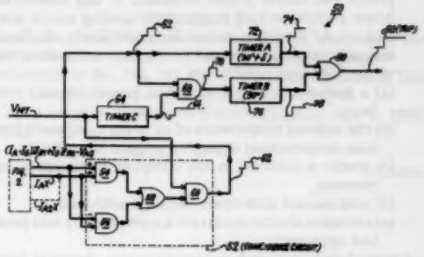
means for matching impedance in said circuit with said gate to the impedance of the circuit and said on/off switch for providing a low current across said on/off switch.

4,447,845

REACTANCE RELAY

Stanley B. Wilkinson, Havertown, Pa., assignor to General Electric Company, King of Prussia, Pa.

Filed Jul. 7, 1982, Ser. No. 395,951
Int. Cl.³ H02H 3/26
U.S. Cl. 361—80 **6 Claims**



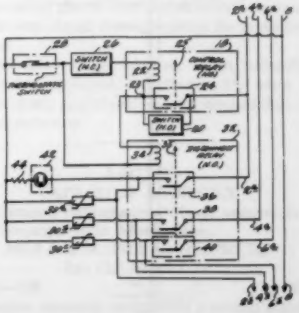
1. A reactance type relay having two characteristic TIMERS A and B and a TIMER C developing an output after a preselected delay following receipt of an input, said characteristic TIMER A providing said reactance type relay with an initial state tent-like characteristic, said characteristic TIMER B providing said reactance type relay with a final state reactance characteristic, said TIMER A having a setting of $90° + \delta$, which produces an angle of separation of δ electrical degrees between the tent-like and the reactance characteristics, and means responsive to the generation of an output by TIMER C for shifting the operating characteristic of the relay from the tent-like characteristic of TIMER A to the reactance characteristic of TIMER B.

4,447,846

COMPUTER ENVIRONMENT PROTECTOR

Winston T. McCleery, 4920 Cottage Hill Rd., Suite 5, Mobile, Ala. 36609

Continuation-in-part of Ser. No. 156,342, Jun. 4, 1980, Pat. No. 4,327,397. This application Nov. 12, 1981, Ser. No. 320,569
The portion of the term of this patent subsequent to Apr. 27, 1999, has been disclaimed.
Int. Cl.³ H02H 3/20, 3/24
U.S. Cl. 361—90 **8 Claims**



1. Protective apparatus for protecting an electronic computer powered by electrical power lines from adverse condi-

tions in its immediate environment, said protective apparatus comprising:

a manual shut-down switch,

temperature sensing means;

smoke detecting means;

excess current detecting means connected to monitor the electrical current consumed by said protective apparatus;

input power terminals connectable to said electrical power lines;

output power terminals connectable to power said electronic computer;

electrical disconnect means connected between said input power and output power terminals, to said manual shut-down switch, to said temperature sensing means and to said smoke detecting means for controllably disconnecting said computer from said power lines in response to any of the following conditions;

(a) a temporary loss of electrical power on said power lines,

(b) the ambient temperature of air in the computer's immediate environment exceeds a present temperature,

(c) smoke is detected in the computer's immediate environment,

(d) said manual shut-down switch is activated,

(e) excessive electrical current is consumed by said protective apparatus;

a manual start-up switch connected to said electrical disconnect means for causing said computer to be connected to said power lines in response to manual activation of the start-up switch in the absence of any of the aforestated conditions;

air conditioner control means including electrical terminals connectable to control the operation of an air conditioner servicing the immediate environment of the computer;

said air conditioner control means being connected to automatically stop a connected air conditioning system when the computer is automatically disconnected from the power lines by said protective apparatus; and

air conditioner override means connected to permit independent start-up and operation of the connected air conditioning system when manually activated.

4,447,847

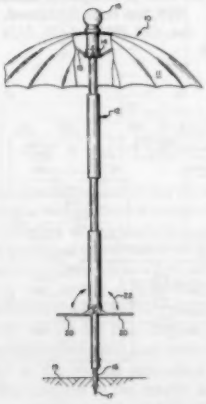
PORTABLE LIGHTNING ROD

Norman R. Drulard, 8035 S.W. Ruby Ter. Portland, Oreg. 97219

Continuation-in-part of Ser. No. 770,419, Feb. 22, 1977, abandoned. This application Sep. 28, 1978, Ser. No. 946,729

Int. Cl.³ H02H 9/04

U.S. Cl. 361—117 **15 Claims**



1. A portable lightning rod comprising:

path means defining an electrically conductive path of sufficient size and current carrying capacity to conduct an electric charge from lightning without disintegration, said path means including:

a. an electrically conductive upper electrode disposed at the uppermost end of said lightning rod and having a lightning-receiving portion adapted to receive an electric charge from lightning,

b. an electrically conductive lower electrode disposed at a lower end of said lightning rod and having sufficient surface area for physical and electrical contact with the earth so that, when said lower electrode is installed in the earth, an electric charge from lightning can be conducted to the earth via said lower electrode, and

c. an electrically conductive central portion electrically connecting said upper and lower electrodes for passage of electrical current therethrough;

an electrically insulative outer layer surrounding said central portion for the electrical insulation of said central portion from the environment; and

an umbrella sheath having an opening therethrough, said sheath being positionable adjacent to the upper end of said lightning rod so that said electrically conductive path means extends through said opening.

4,447,848

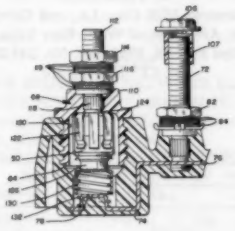
TELEPHONE SURGE PROTECTOR AND HOUSINGS THEREFOR

Thomas J. Smith, Bay Shore, N.Y., assignor to TII Industries Inc., Copiague, N.Y.

Filed May 10, 1982, Ser. No. 376,703

Int. Cl.³ H02H 9/06

U.S. Cl. 361—124 **13 Claims**



1. An overvoltage surge protector housing for protecting communication lines and equipment connected thereto from voltage surges comprising:

(a) a housing of insulating material having at least one well-type aperture disposed therein;

(b) a first terminal adapted to be connected to earth ground;

(c) a first electrode portion disposed at the closed end of said well-type aperture having a generally centrally disposed upwardly extending portion, said first electrode being connected to said first terminal, and

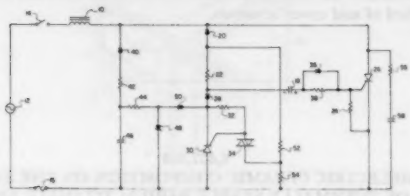
(d) a second terminal removably received within the open end of said well-type aperture having a second electrode portion and means integral with said electrode portion for connection to one of said communication lines, said second terminal including protector means retained therein and adapted to be in intimate contact with said first and second electrode portions when disposed in said well-type aperture.

4,447,849

ELECTROMAGNETIC CONTROL CIRCUIT

Jack B. Harwell, Grapevine, Tex., assignor to Teccor Electronics, Inc., Euless, Tex.

Filed Jul. 1, 1982, Ser. No. 394,437
Int. Cl.³ H03K 17/72
U.S. Cl. 361—152 8 Claims



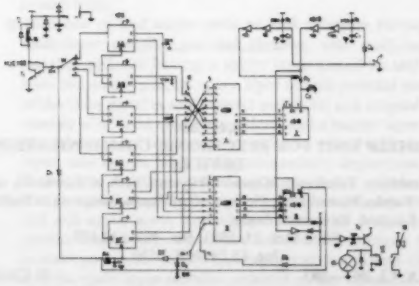
1. An electromagnetic control circuit comprising:
an electromagnetic winding means adapted to be coupled in series with an alternating current potential source;
switch means adapted to be coupled in series with said electromagnetic winding means and said alternating current potential source; and
control means coupled in series with said electromagnetic winding means and said switch means, said control means for controlling the conduction of current through said electromagnetic winding means, said control means comprising:
a gate controlled conduction device;
capacitive means coupled to the gate of said gate controlled conduction device;
means for charging said capacitive means during a negative half cycle of said alternating current potential source after the closing of said switch means; and
means for discharging said capacitive means through the gate of said gate controlled conduction device, in timed relationship with said alternating current potential source wherein said gate controlled conduction device is placed into a conductive state only during a positive half cycle after the closing of said switch means.

4,447,850

ELECTRONIC LOCK

Eldad B. Asher, 32 Margalit St., Haifa, Israel

Filed Jan. 20, 1982, Ser. No. 340,840
Claims priority, application Israel, Feb. 1, 1981, 62037
Int. Cl.³ E05B 49/00
U.S. Cl. 361—172 12 Claims



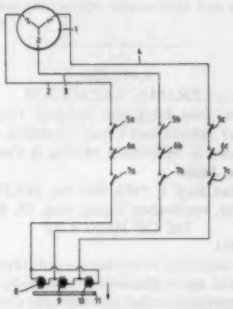
1. A digital-code operated circuit for an electronic lock comprising a single pushbutton to alternatingly close and open a circuit to provide pulses of specific numbers and groupings constituting digits and sequence of digits respectively, converting means to convert the number of said pulses per digit and the number of said groupings per digit sequence, from serial to parallel, discrimination means to distinguish between discrete pulses constituting a single digit and between complete digits constituting a digit sequence, memory means to store the data produced by said converting means, program means in which said digital code can be set, verification means to verify whether the pulses provided by said single pushbutton produce digit sequences conforming to said digital code as set in said program means, wherein a signal for the unlocking of said lock is produced only by conformance with said code.

4,447,851

TRIP SYSTEM

Peter E. Simmons, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 281,105, Jul. 7, 1981, abandoned. This application Jul. 11, 1983, Ser. No. 512,710
Claims priority, application United Kingdom, Jul. 7, 1980, 8022205
Int. Cl.³ H02H 1/04
U.S. Cl. 361—189 9 Claims



1. A trip system which comprises:
three switches which are each either (a) normally open and adapted to close or (b) normally closed and adapted to open in response to a common trip initiating event,
each of said switches being connected to and operating on a respectively corresponding one of three lines carrying the different respective phases of a three phase power supply,
three trip actuators each electrically connected between a different pair of the said lines, one of said switches being connected on each of the lines between the power supply and the trip actuators,
the trip actuators being adapted, when normally open switches are employed, to actuate a trip when both switches of the pair of lines connected to at least one of the actuators are closed thus energising the actuator in question, and
the trip actuators being adapted, when normally closed switches are employed, to actuate a trip when both the switches in any pair of said lines are opened thus de-energising the actuators.

4,447,852

CAPACITOR ASSEMBLY

Warren J. Clement, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Jun. 14, 1982, Ser. No. 387,739
Int. Cl.³ H01G 1/14
U.S. Cl. 361—306 14 Claims

1. A capacitor assembly comprising a wound and flattened extended-foil capacitor section, a capacitor case having an insulating cover and an insulating base, a one-piece conductive bus having a horizontal bottom portion and a vertical side

portion, conductive means passing through said bottom portion and said base securing said bus to said base, said side portion having spaced apart extensions clamped against foil

edges extending from an end of said section and holding said section in place and electrically connecting said foil edges to said bus.

4,447,853

CERAMIC CAPACITOR

Noboru Tomuro; Isao Ishiguchi; Shinjiro Tsujikawa; Masao Kashima, all of Yokoze, and Yasuo Miyashita, Chichibu, all of Japan, assignors to Mitsubishi Mining & Cement Company, Ltd., Chiyoda, Japan

Filed Aug. 1, 1983, Ser. No. 519,172
Claims priority, application Japan, Aug. 25, 1982, 57-146233
Int. Cl.³ H01G *4/12*
U.S. Cl. 361—321 **3 Claims**

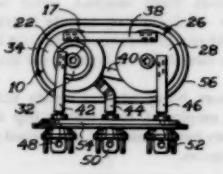
1. A ceramic capacitor comprising a polycrystalline ceramic dielectric material and a plurality of electrodes of conductive material, characterized in that said ceramic dielectric material is disposed between at least one pair of opposing electrodes and has a thickness not more than 30 μm and a particle size not more than one fifth of the thickness of said dielectric material.

4,447,854

OVAL DUAL-AC-CAPACITOR PACKAGE

Paul M. Markarian, North Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Nov. 22, 1982, Ser. No. 443,266
Int. Cl.³ H01G *4/32*
U.S. Cl. 361—329 **14 Claims**



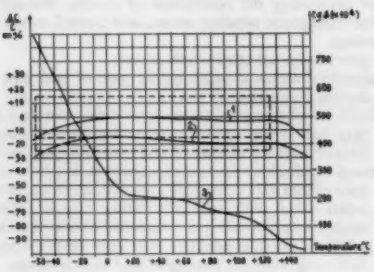
1. An oval dual-AC-capacitor package comprising a substantially-oval-cylindrical housing having a cover at one end thereof; three feed-through terminals being mounted in said cover; two circular-cylindrical capacitor sections having essentially the same length, each of said sections being enclosed in said housing and having two convolutely wound sheet-plastic strips and two metal films respectively positioned alternately between said plastic strips, each of said metal films in a first of said sections being wholly contiguous and unitary, one of said films in the second of said sections also being contiguous and unitary, the other of said films in said second section having been opened in a middle portion thereof and divided into an inner winding portion and an outer winding portion; and electrical connection means (a) for connecting one of said first-section-metal films to said one film of said second section and further to a first of said cover terminals, (b) for connecting said inner-winding metal film portion to a second of said cover terminals and (c) for connecting said outer-winding metal film portion to the other of said first-section metal films and to the third of said cover terminals.

4,447,855

DIELECTRIC CERAMIC COMPOSITION ON THE BASE OF THERMALLY STABLE BARIUM TITANATE AND CAPACITOR USING SUCH COMPOSITION

Alain Lagrange, and Alain Rossello, both of Bagnolet, France, assignors to LCC. Cice-Compagnie Europeanne de Composants Electroniques, Bagnolet, France

Filed Feb. 28, 1983, Ser. No. 470,525
Claims priority, application France, Mar. 2, 1982, 82 03423
Int. Cl.³ H01G *1/01, 3/135*
U.S. Cl. 361—321 **12 Claims**



1. A ceramic capacitor comprising at least one dielectric layer and at least two electrodes, each pair of said electrodes being separated by said dielectric layer, wherein said dielectric layer comprised from 80 to 94% by weight of barium titanate, from 1 to 3% by weight of neodymium oxide, from 0 to 4% bismuth oxide, from 2 to 5% by weight of bismuth titanate ($Bi_2O_32TiO_2$) and from 2 to 8% by weight of glass frit, the whole having been selected so as to form 100% by weight.

4,447,856

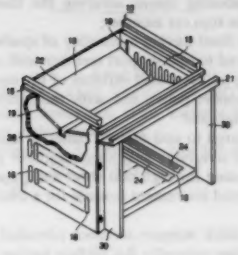
SHELF UNIT FOR ELECTRONIC COMMUNICATION DEVICES

Yoshihiro Takahashi; Katsuo Okuyama, both of Kawasaki, and Yutaka Matsukuma, Hatano, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 23, 1981, Ser. No. 314,427
Int. Cl.³ H05K *7/20*
U.S. Cl. 361—383 **29 Claims**

1. An electronic communication device shelf unit having means for mounting printed circuit boards therein, wherein the shelf unit has means for mounting itself upon another shelf unit, said shelf unit comprises: hollow side plates which are provided, on their outer faces, with air inlet openings; and a top plate which is connected to the side plates and which has an

inclined heat diffusion plate defining thereon an air introduction space; and wherein said side plates are provided, on their



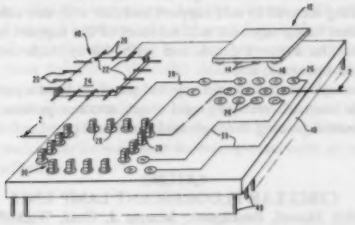
inner faces, with openings communicating with the air introduction space.

4,447,857

SUBSTRATE WITH MULTIPLE TYPE CONNECTIONS

Robert Marks, South Burlington; Douglas W. Phelps, Jr., and William C. Ward, both of Burlington, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 9, 1981, Ser. No. 328,889
Int. Cl.[3] H05K *1/09, 1/18*
U.S. Cl. 361—395 4 Claims



1. A package for semiconductor integrated circuits comprising:

a substrate having input/output means;

a plurality of solder pads on said substrate;

at least one integrated circuit chip having its back surface attached to said substrate in a face-up configuration with contact pad metal adapted to receive wire bond type connections;

at least one of said solder pads on said substrate having a multi-layer metallic pedestal thereon, said multi-layer metallic pedestal having a solder layer joined to said at least one solder pad, an upper layer of said pedestal made of the same metal as said contact pad metal and adapted to receive wire bond type connections, and a barrier layer of metal interposed between said solder layer and said upper layer, said barrier layer being substantially impervious to both solder and the metal of said upper layer;

a wire formed from the same metal as the contact pad metal and said upper layer, bonded thereto to form a high temperature sustaining wire bond connection between the contact pad metal on the face-up integrated circuit chip and the multi-layer metallic pedestal on the substrate;

a predetermined number of said solder pads arranged in a pattern for interconnecting at least one integrated circuit chip to said substrate in a flip-chip configuration;

at least one integrated circuit chip attached to said substrate in a flip-chip configuration by means of said predetermined number of solder pads which are arranged for interconnecting integrated circuit chips in a flip-chip configuration;

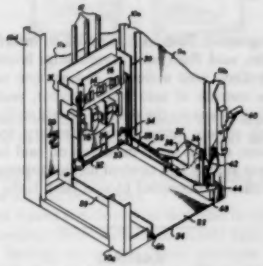
interconnecting conductor lines on said substrate for providing electrical connections between a preselected number of said solder pads which are connecting an integrated circuit chip to said substrate in a face-up configuration and a preselected number of said solder pads connecting an integrated circuit chip to said substrate in a flip-chip configuration.

4,447,858

RIGID SUBCHASSIS STRUCTURE FOR MOTOR CONTROL CENTER OR THE LIKE

Samir F. Farag; Alvin R. Hoffmann, and John D. Kleinecke, all of Wichita Falls, Tex., assignors to Siemens-Allis, Inc., Atlanta, Ga.

Filed Apr. 28, 1982, Ser. No. 373,029
Int. Cl.[3] H02B *1/04*
U.S. Cl. 361—429 8 Claims



1. A motor control center, comprising:

a deformable, alignable framework having vertical frame members and horizontal frame members enclosed by sheet material and including at least one compartment for receiving a contactor carriage assembly, a rigid subchassis for receiving said carriage assembly, said subchassis having a generally flat guide plate member mounted horizontally within said compartment, said guide plate member comprising an extended, generally flat lower section having front and back ends and opposed sides, upturned edge members extending at each of said sides for receiving and guiding said carriage assembly therein, and means at said front and back ends attaching said guide plate member to said horizontal frame members, said guide plate member being free of direct attachment to said vertical frame members;

a pair of upstanding angle members attached to said guide plate member adjacent to the back end thereof, one leg of each angle member extending parallel to said back end, the other leg extending parallel to and overlapping one of said upturned edge members;

means coupling each of said other legs of said angle members to the adjacent one of said upturned edge members of said guide plate member;

a cross member coupled between said angle members at a point spaced from the back edge of said guide plate member;

electrical connection means mounted to said cross member for engagement by said carriage assembly;

a rotatable cross shaft having opposed ends and carriage-engaging means extending therefrom, said opposed ends being supported at opposite sides of said subchassis; and

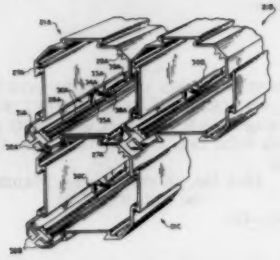
a rigid bracket means rigidly affixed to one of said upturned edges and supporting at least a portion of a racking mechanism thereon for rotating said cross shaft.

4,447,859

MODULAR FLASH SYSTEM

Walter V. Raczynski, Chicago, Ill., assignor to Inverse Square Systems Incorporated, Chicago, Ill.

Filed Nov. 26, 1982, Ser. No. 444,718
Int. Cl.[3] G03B 15/02
U.S. Cl. 362—13 33 Claims



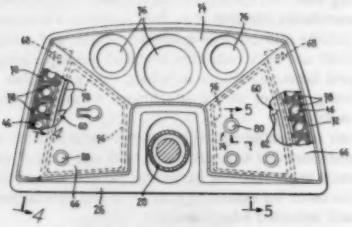
1. A photographic flash unit adapted to interfit with other like flash units, said flash unit comprising: housing structure including a hollow wall member, at least one male coupling means on the outside of said wall member, and at least one female coupling means on the outside of said wall member, said male coupling means being complementary to said female coupling means; a flash lamp mounted on said housing structure; and power supply and control means disposed within said housing structure and coupled to said flash lamp for energization thereof.

4,447,860

BACKLIGHTED INSTRUMENT CONSOLE FOR A TRACTOR

Lawrence J. Stone, Livonia, and Richard J. Wells, Ferndale, both of Mich., assignors to Massey-Ferguson Inc., Detroit, Mich.

Continuation of Ser. No. 886,006, Mar. 13, 1978, abandoned.
This application Nov. 14, 1980, Ser. No. 222,869
Int. Cl.[3] G01D 11/28
U.S. Cl. 362—30 5 Claims



1. In combination with a tractor provided with a cab having a forward portion, a backlighted instrument console comprising:

a relatively fixed support member secured to the forward portion of the cab and provided with a rearwardly facing generally flat surface having a plurality of spaced apart openings and a relatively large aperture extending through said support member;

a plurality of selectively operable light emitting devices;

means mounting the light emitting devices in association with said openings, there being only one light emitting device associated with each of the openings;

a generally thin flat support panel associated with said support member with a portion of the panel extending across said aperture, the panel being mounted in such a manner that its rear surface lies in the same plane as the generally flat surface of said support member;

peripheral fastening means securing the thin flat support panel to the support member;

a translucent sheet having a plurality of symbols, said sheet being secured to said support member with one side of the sheet being adjacent said surfaces of the support member and the support panel, and with the symbols overlying said openings; and

a control secured to said support panel, at least a portion of the control overlying said sheet, another portion of the control passing through said sheet and panel.

2. A backlighted instrument console for a tractor or the like comprising:

a relatively thick support member provided with a rearwardly facing generally flat surface having a plurality of spaced apart openings and a relatively large aperture extending through said support member;

a plurality of selectively operable light emitting devices;

means mounting the light emitting devices in association with said openings, there being only one light emitting device associated with each of the openings;

a generally thin flat support panel associated with said support member with a portion of the panel extending across said aperture, the panel being mounted in such a manner that its rear surface lies in the same plane as the generally flat surface of said support member;

peripheral fastening means securing the thin flat support panel to the support member;

a translucent sheet having a plurality of symbols, said sheet being secured to said support member with one side of the sheet being adjacent said surfaces of the support member and the support panel, and with the symbols overlying said openings; and

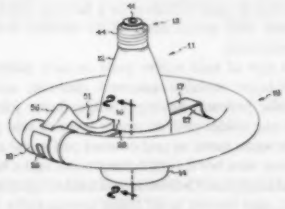
a control secured to said support panel, at least a portion of the control overlying said sheet, another portion of the control passing through said sheet and panel.

4,447,861

CIRCULAR FLUORESCENT LAMP UNIT

Frederick Hetzel, Brookpark; Martin J. Graf, Wickliffe, and Douglas Seredich, Chardon, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

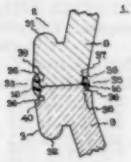
Filed Dec. 21, 1981, Ser. No. 333,200
Int. Cl.[3] F21S 5/00
U.S. Cl. 362—216 2 Claims



1. A circular fluorescent lamp unit comprising a central hub containing lamp ballast means, a plurality of support arms extending radially from said hub and adapted to hold a circular fluorescent lamp in a position surrounding said hub, at least one of said support arms comprising a sheet member extending through a support arm slot in said hub and having a substantially right-angle bend within said hub to form an inner length thereof within said hub which extends substantially parallel to the hub axis, and said hub further comprising receptacle means for securing said sheet member at the end region of said inner length spaced from said right-angle bend to provide means

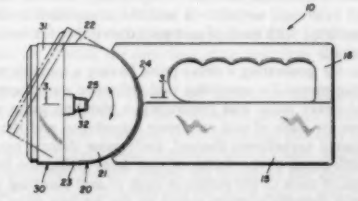
causing one or more of said support arms to have a limited amount of radial sliding movement with respect to said hub.

4,447,862
SEALED BEAM LAMP UNIT SEALING SURFACES
Bruce E. Shanks, Chesterland, Ohio, assignor to General Electric Company, Schenectady, N.Y.
Filed Apr. 5, 1982, Ser. No. 365,435
Int. Cl.³ F21V 29/00
U.S. Cl. 362—267 9 Claims



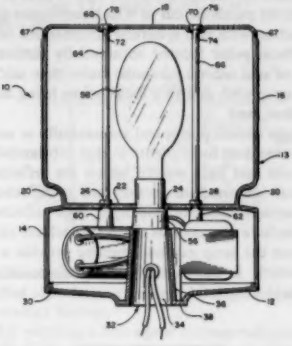
1. A sealed beam lamp unit comprising a lens and reflector having substantially polygonal peripheries and cooperating and opposing planar sealing surfaces characterized by sides and corners, located approximately about said peripheries and with said planar sealing surfaces being in physical contact along the sides but spaced apart at the corners, with adhesive disposed on and between said planar sealing surfaces wherein a first of said planar sealing surfaces has corners protruding from a plane defined by the sides thereof and cooperating and opposing corners of a second of said planar sealing surfaces, said second planar sealing surface corners indented from a plane defined by the sides thereof, and with each side of said planar sealing surfaces further including reservoirs to contain excess adhesive.

4,447,863
HAND-HELD LIGHT WITH SWIVEL HEAD
Kenneth R. Fenne, 3 S. 220 Park Blvd., Glen Ellyn, Ill. 60137
Filed Jan. 24, 1983, Ser. No. 460,590
Int. Cl.³ F21L 7/00
U.S. Cl. 362—199 13 Claims



1. A hand-held light comprising a handle. a support for said handle, a head having an interior, a bulb socket mounted in said head on the interior thereof, at least one leg on said support and extending into the interior of said head, and pivot means in said head disposed entirely in the interior thereof and rotatably attached to said leg at a location spaced from said support, thereby swivelly mounting said head to said support.

4,447,864
POST TOP LUMINAIRE
Donald C. Smith, Auburn; Richard F. Snow, Manlius, and George B. Pauli, Chittenango, all of N.Y., assignors to Crouse-Hinds Company, Syracuse, N.Y.
Filed Feb. 25, 1982, Ser. No. 352,129
Int. Cl.³ F21V 3/00
U.S. Cl. 362—311 23 Claims



1. A luminaire adapted to be mounted at the top of a post and to direct light below a horizontal plane, said luminaire comprising:

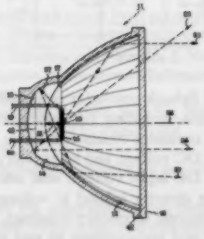
a base having a mounting means for mounting said luminaire above an area to be lighted;

an electrical means positioned on said base to operate a lamp;

a unitary housing element received on said base, said housing element having upper and lower portions of generally cylindrical shape with an intermediate interior insulator panel intersecting the housing element sides to form a substantially H-shaped cross section, the lower cylindrical portion enclosing said electrical means and the upper cylindrical portion forming a light refractor means for said lamp; and

a cover enclosing the top of said housing element.

4,447,865
REFLECTOR LAMP
David D. VanHorn, East Cleveland; John M. Putz, Twinsburg, and Alfred J. Henderson, Jr., Shaker Hts., all of Ohio, assignors to General Electric Company, Schenectady, N.Y.
Filed May 13, 1982, Ser. No. 377,754
Int. Cl.³ F21V 7/00
U.S. Cl. 362—305 11 Claims



1. A lamp comprising a substantially concave reflector having faceted surfaces longitudinally extending along a major portion of a front section of said reflector, said faceted surfaces comprising subsections each of which is rotated about an axis predeterminedly located relative to the longitudinal axis of said lamp, said front section being substantially defined by a surface

of revolution of a first parabolic curve whose focal point is relatively close to the vertex thereof with the surface terminating essentially at the latus rectum thereof,

an intermediate section of substantially spherical configuration having a center substantially at the focal point of said front section and a diameter essentially the length of said latus rectum,

a rear section substantially defined by a surface of revolution of a second parabolic curve which terminates at the circular junction with said spherical intermediate section, having a focal point located substantially farther from the vertex of said second parabolic curve than said first parabolic curve with said two focal points being substantially coincident, and

a finite light source positioned substantially at said substantially coincident focal points so that substantially all light rays from said light source which are reflected by said spherical intermediate section are re-reflected by said front section, wherein said light rays reflected by said facets include components thereof which are circumferential about the lamp axis and thereby provide a beam pattern which is substantially circumferentially uniform about said lamp axis.

4,447,866

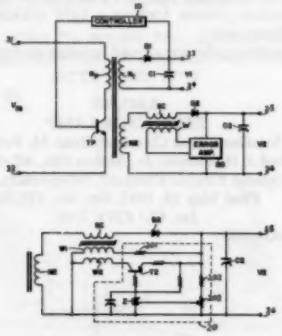
SUPPLEMENT TO CROSS REGULATION IN DC TO DC CONVERTERS

Charles R. Reeves, San Jose, Calif., assignor to Conver Corporation, Cupertino, Calif.

Continuation of Ser. No. 048,498, Jun. 14, 1979, abandoned. This application Oct. 14, 1981, Ser. No. 311,437

Int. Cl.³ H02M *3/335*

U.S. Cl. 363—21 **6 Claims**



1. A DC to DC flyback converter comprising:

transformer means including first and second secondary windings and transistor means and diode means for providing a main DC voltage and an auxiliary DC voltage in response to a DC input voltage, said main and auxiliary voltages being directly related to voltages provided by said first and second secondary windings, respectively;

means coupling said main voltage to said transistor means for regulating said main voltage;

a saturable core inductor having a saturable inductor winding connected in series with said second secondary winding, said inductor having at least one control winding; and

error amplifier means, connected to said saturable core inductor, for controlling current through said control winding in response to said auxiliary voltage.

4,447,867

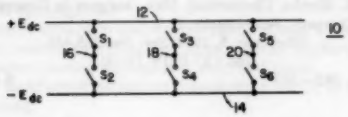
MULTIPHASE INVERTER DRIVE CIRCUIT WITH SYNCHRONIZED SWITCHING DELAY FEATURE

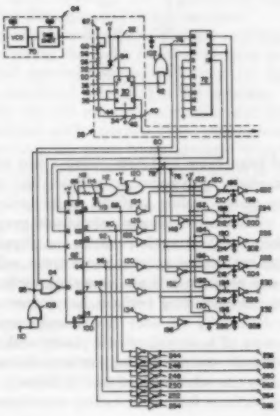
William E. Evans, and Jimmie D. Gillett, both of Garland, Tex., assignors to Varo, Inc., Garland, Tex.

Filed Jan. 29, 1982, Ser. No. 343,748

Int. Cl.³ H02M *7/217*

U.S. Cl. 363—56 **13 Claims**





1. A circuit for leading edge delay in synchronized switching waveforms, comprising:

a first power terminal;

a second power terminal

a plurality of output terminals;

a plurality of complementary paired switches, each of said pairs associated with one of said output terminals and having a first and second switch, the first and second switch of each of said paired switches alternately connecting said first and second power terminals to the associated one of said output terminals;

means for generating a plurality of synchronized reference pulse waveforms and the complements thereof, each of said reference waveforms and the complements thereof associated with each of said paired switches for switching thereof;

means for generating a delay pulse having a variable width;

steering means for receiving said reference waveforms and said delay pulse and generating a blanking pulse waveform for each of said reference waveforms and the complement waveforms thereof, each pulse therein having a width equal to the width of said delay pulse, the leading edge of each of the pulses in each of said blanking waveforms directly corresponding to the leading edge in the corresponding pulse of said reference waveforms and said complement waveforms;

blanking means for receiving said reference waveforms, said complement waveforms and said blanking waveforms, said blanking means outputting a plurality of corresponding delayed pulse waveforms, each pulse therein having the trailing edge thereof directly corresponding to the trailing edge of each of the pulses in each of the corresponding one of said reference waveforms and said com-

plements thereof and the leading edges thereof delayed by the width of said delay pulse, each of said delayed waveforms for driving each of the first and second switches of each of said paired switches wherein closing of the first or second switch in each of said paired switches is delayed to allow the complementary switch thereof sufficient time to open; and

an inhibit circuit for generating an inhibit signal to inhibit said blanking means from generating said delayed waveforms corresponding to said complementary waveforms.

4,447,868

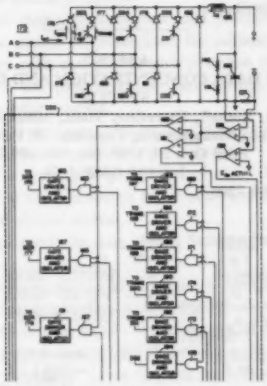
REGENERATIVE RECTIFIER CIRCUIT

Fred G. Turnbull, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 5, 1982, Ser. No. 365,706

Int. Cl.³ H02P *13/26*

U.S. Cl. 363—81 **3 Claims**



1. A phase controlled three phase regenerative rectifier responsive to an external dc voltage command, for receiving input power from a three phase ac source and supplying direct current to an external load, comprising:

a phase-controlled three phase rectifier having a plurality of gate-controlled rectifying elements arranged in a bridge configuration;

a plurality of controllable switch means with self-commutating ability coupled, respectively, in inverse parallel with each rectifying element, respectively, said plurality of controllable switch means forming an inverter;

means for sensing the output voltage of said rectifier;

means for sensing the direction of current flow to the external load; and

control means responsive to the means for sensing rectifier output voltage and to the means for sensing current flow to the external load, and coupled to said plurality of gate-controlled rectifying elements and to said plurality of controllable switch means, for adjusting the phase lag of said rectifying elements and the phase lead of said controllable switch means responsive to the direction of current flow to said external load and the difference between the dc voltage command and actual dc voltage across said external load, so that when the current supplied to the load is positive the phase lag of said rectifying elements is adjusted to provide the commanded dc voltage and when said current in said load is zero or negative the phase lead of the controlled switch means provides regenerative current to the ac source.

4,447,869

CONTROL CIRCUIT WITH AN AUXILIARY PROCESS VARIABLE

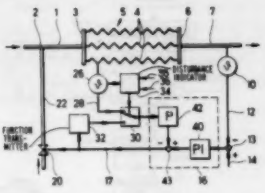
Rudolf Herzog, Tobel, Switzerland, assignor to Suzer Brothers Ltd., Winterthur, Switzerland

Filed Nov. 2, 1981, Ser. No. 317,283

Claims priority, application Switzerland, Nov. 11, 1980, 8352/80

Int. Cl.³ G05B *23/02, 11/42*

U.S. Cl. 364—184 **5 Claims**



1. In combination

a controlled plant having an input for receiving a medium to be processed therein;

a meter for emitting a first signal corresponding to a process variable of the medium processed in said plant;

a controller having a pair of inputs and an output, one of said inputs being connected to said meter to receive said first signal;

a final control element connected to said controller output to receive a control signal therefrom for controlling the medium delivered to said plant;

a signal transmitter connected to said plant near said plant input for emitting a second signal in response to an auxiliary process variable of the medium;

a selector having a pair of inputs and an output, one of said selector inputs being connected to said signal transmitter to receive said second signal and said selector output being connected between said one selector input and a second of said controller inputs to deliver said second signal thereto;

a function transmitter connected to and between said controller output and a second of said selector inputs to deliver the control signal from said controller output to said second selector input; and

a disturbance indicator connected to and between said signal transmitter and said selector to switch said selector output to said second selector input in response to an output signal from said signal transmitter falling below a bottom threshold value or above a top threshold value.

4,447,870

APPARATUS FOR SETTING THE BASIC CLOCK TIMING IN A DATA PROCESSING SYSTEM

Steven A. Tague, Billerica, and Virendra S. Negi, Pepperell, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Apr. 3, 1981, Ser. No. 250,823

Int. Cl.³ G06F *1/04*

U.S. Cl. 364—200 **4 Claims**

1. A microprogram controlled data processing system comprises:

clocking means for generating cyclic timing signals having predetermined frequencies, said clocking means including switching means for generating a set clock signal and a plurality of clock delay signals; and

control store means including

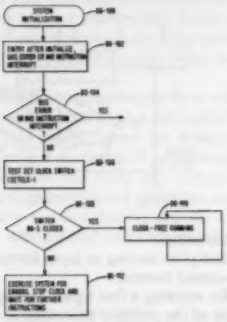
read only memory means for storing a plurality of microprogram words in a plurality of memory locations;

addressing means for addressing said plurality of memory locations; and

register means for storing a microprogram word read

from a memory location specified by said addressing means,

wherein said addressing means is responsive to said set clock signal and a first microprogram word read from a first memory location specified by said addressing means during a first cycle of operation and stored in said register means for repeatedly addressing a second memory location for repeatedly transferring a second microprogram word to said register means



during all subsequent cycles of operation; said clocking means further including

non-stall means coupled to said register means and responsive to said second microprogram word for generating a plurality of non-stall signals; and

gating means responsive to said plurality of non-stall signals and selected ones of said plurality of clock delay signals for generating said cyclic timing signals having said predetermined frequencies.

4,447,871

DATA COMMUNICATION SYSTEM WITH A FRONT-END-PROCESSOR

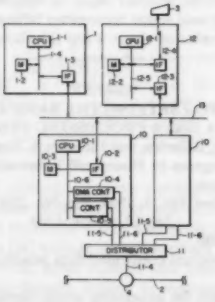
Matsuaki Terada, Sagamigara, and Koji Yokota, Kawasaki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 2, 1981, Ser. No. 230,805

Claims priority, application Japan, Feb. 4, 1980, 55-11510

Int. Cl.³ G06F *15/16, 9/19*

U.S. Cl. 364—200 **13 Claims**



1. A data communications system for transmitting data including address information and text between computers in a multi-computer system comprising a communication line for transmitting said data between a plurality of stations connected to said communication line which respectively transmit over said communication line to other stations data received via an associated distribution circuit from an associated computer and which respectively receive over said communication line data transmitted by other stations to its associated computer, each station being associated with a different computer within the multi-computer system, each associated pair of computer and station being further associated with a separate distributor and a separate plurality of preprocessors, respectively, each distributor having a single bus coupled to its associated station for transferring data to and from said station and a plurality of distributing busses each being coupled to a separate one of said plurality of preprocessors associated with said associated computer, distributor, and station for transferring data to and from said preprocessor, the preprocessors being coupled to said distributor for parallel operation with said distributor; a plurality of data transfer busses each being coupled between a different one of said plurality of preprocessors, and said computer associated with said station and said distributor and said plurality of preprocessors for transferring data to and from said computer, each preprocessor upon receiving data from said coupled distributor functioning to perform data processing on the received data prior to transmitting processed data to said coupled computer and upon receiving data from said coupled computer functioning to perform data processing on the received data prior to transmitting said processed data to said coupled distributor.

4,447,872

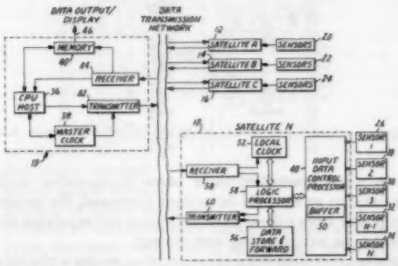
ALARM DATA CONCENTRATION AND GATHERING SYSTEM

Eugene M. Nothaft, Shoreview, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 20, 1980, Ser. No. 199,029

Int. Cl.³ G06F *3/04*

U.S. Cl. 364—200 **6 Claims**



1. A system enabling bidirectional communications over a switched data transmission network between a central station and a plurality of satellite stations wherein

A. said central station comprises

(i) master clock means for maintaining an ongoing time including the current week, day, hour, and minute,

(ii) memory means having designated addresses associated with storage locations at which data signals associated with each satellite station are stored, said signals including a unique satellite station address code which is different for each satellite station, and a predetermined time setting which is also different for each sateliite station and establishes the routine time at which each satellite station is required to initiate communication with the central station,

(iii) means for receiving from each said satellite station data signals including a said address code whereby a said bidirectional communication is initiated by the communicating satellite station having that address code,

(iv) means for transmitting data signals to a given satellite station identified by its address code, and

(v) central processing means including

(a) means coupled to said memory means for inputting at said storage locations data signals including said prede-

termined time setting and said satellite station address code for each satellite station,

(b) means for initiating a storage location at its designated address within said memory means in response to receipt of a transmission originating within said communicating satellite station, and containing its satellite station address code,

(c) means for routing said received data signals to an accessed storage location for storage thereat,

(d) means responsive to said master clock means and to said memory means for providing instructions for the communicating satellite station, said instructions including an updated ongoing time signal and an updated predetermined time setting, and coupled to said transmitting means for enabling transmission of said instructions to the communicating satellite station, and

(e) means for terminating said communication; and wherein

B. each satellite station comprises

(i) local clock means responsive to said instructions from said central station for controlling the initiation of communications with the central station at the time corresponding to the predetermined time setting associated with that satellite station,

(ii) store and forward means for accumulating data for subsequent transmission to said central station,

(iii) means for transmitting signals including the address code for that satellite station and routine and non-routine data to said central station,

(iv) means for receiving data signals from said central station, and

(v) data processing means for controlling the flow of data signals within the satellite station and for controlling the transmission of data signals to and receipt of data signals from said central station, said processing means including

(a) means responsive to an updated ongoing time signal received from said central station for synchronizing said local clock means and responsive to an updated predetermined time setting received from the central station for adjusting said local clock means to the updated predetermined time setting,

(b) means for processing routine and non-routine data derived from external sensors including informationas to the nature of the derived data and for inputting such processed data into the store and forward means,

(c) means responsive to a signal from said local clock means when the ongoing time and the predetermined time setting are the same for activating said transmitting means of the satellite station to thereby initiate transmission to said central station at the time determined by the predetermined time setting, and to enable transmission of accumulated routine data, and

(d) means responsive to non-routine data for initiating said transmission to said central station at any time on a priority interrupt basis to enable immediate transmission of said non-routine data,

whereby communications between each satellite station and the central station are initiated by the satellite station, routine data are received and held within each of said satellite stations and are transmitted to said central station at different predetermined times, and non-routine, emergency data are immediately transmitted to the central station to enable immediate central response to such emergency data.

4,447,873

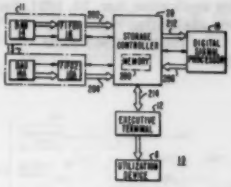
INPUT-OUTPUT BUFFERS FOR A DIGITAL SIGNAL PROCESSING SYSTEM

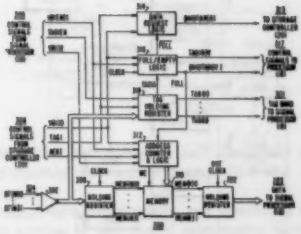
William L. Price, Severn; John C. Murtha, Towson; James A. Ross, Jr., Aberdeen; Clyde E. Adam, and Kenneth R. Lucas, both of Sykesville, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 832,853, Sep. 13, 1977, Pat. No. 4,166,289. This application May 5, 1980, Ser. No. 146,934

Int. Cl.³ G06F *3/04, 13/00*

U.S. Cl. 364—200 **5 Claims**





1. A buffer for transferring a plurality of vectors, each vector having a varying number of data words up to a predetermined maximum number between first and second data terminals wherein

said buffer is in signal communication with said first and second data terminals; comprising:

(A) first storage means for storing a vector of data words and having storage capacity to store the largest vector to be transferred;

(B) first requesting means, including determining means, responsive to control signals from said first and second data terminals, having a first state indicating when said first storage means is empty of any stored data words of a vector from said first data terminal and a second state indicating when said first storage means contains a vector of data words regardless of empty storage capacity to transfer to said second data terminal;

said first requesting means being responsive to control signals from said first data terminal and said first state of said determining means for requesting a transfer of a vector of data words between said first data terminal and said first storage means, said first requesting means further being responsive to said second state of said determining means for requesting a transfer of a vector of data words between said first storage means and said second data terminal; and

(C) first transferring means, responsive to said first state of said determining means and to control signals from said first data terminal for transferring during a first time interval a vector of data words from said first data terminal to said first storage means

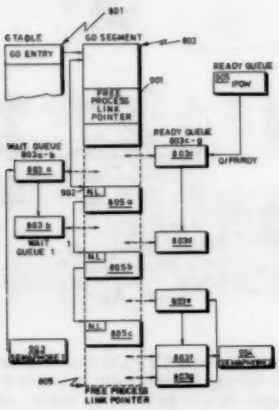
and responsive to said second state of said determining means and to control signals from said second data terminal for transferring during a second time interval after said first time interval said vector of data words in said first storage means to said second data terminal.

4,447,874

APPARATUS AND METHOD FOR COMMUNICATION OF INFORMATION BETWEEN PROCESSES IN AN INFORMATION SYSTEM

John J. Bradley, Garches, France; Benjamin S. Franklin, Cambridge, Mass.; David M. Slosberg, Paris, France; Marc Appell, Paris, France; Jean-Claude Cassonnet, Paris, France, and Philippe D. De Sabatier, Paris, France, assignors to Compagnie Honeywell Bull, Paris, France

Continuation of Ser. No. 60,161, Jul. 24, 1979, abandoned, which is a continuation of Ser. No. 911,815, Jun. 1, 1978, abandoned, which is a continuation of Ser. No. 570,101, Apr. 21, 1975, abandoned. This application Apr. 14, 1981, Ser. No. 254,185
Claims priority, application France, Apr. 25, 1974, 74 14489
Int. Cl.[3] G06F 9/00
U.S. Cl. 364—200 8 Claims



1. In a computing system capable of processing a plurality of processes including central memory means for storing a process control block for each of the processes, means for operating the processes in queues, central processor means for executing one of the processes during a predetermined time and for maintaining the unexecuted processes in queues located in the central memory means, said unexecuted queues being organized by priority into various states of readiness for execution, distributor means for giving command of the central processor means to the one of the processes having the highest priority, and means for assigning to each of the processes a process ring number symbolizing a priority level, improved apparatus for communicating instructions between at least some of the processes comprising:

memory element means located in each process control block for storing information;

means responsive to the process being executed for modifying the information stored in the memory element means associated with processes to which instructions are to be communicated;

interrupt means responsive to the information stored in the memory element means for causing an interrupt; and

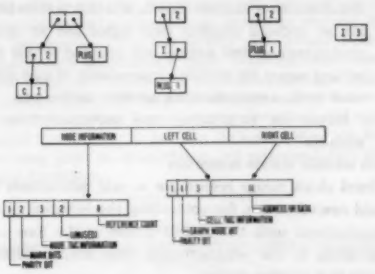
exceptions means responsive to the interrupt for enabling the instruction to be communicated to each process corresponding to a memory element means in which the modified information was stored.

4,447,875

REDUCTION PROCESSOR FOR EXECUTING PROGRAMS STORED AS TREELIKE GRAPHS EMPLOYING VARIABLE-FREE APPLICATIVE LANGUAGE CODES

Brent C. Bolton, Austin, Tex.; Carl F. Hagenmaier, Jr., Pittstown, N.J.; Gary L. Logsdon, Round Rock, and Robert L. Miner, Jr., Austin, both of Tex., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jul. 7, 1981, Ser. No. 281,064
Int. Cl.[3] G06F 7/00
U.S. Cl. 364—200 12 Claims



1. A reduction processing system for executing programs stored as treelike graphs employing a variable-free applicative language code, said system comprising:

random access storage means for storing said code in the form of two-cell nodes representing different ones of said graphs, one of said cells in some of each nodes containing a storage address of another node, another of said cells in some of each nodes containing code representing a functional variable and another of said cells in some of each nodes containing a variable-free operator code specifying a function substitution; and

processor means including retrieving means coupled to said random access storage means to retrieve said two-cell nodes for reduction thereof and substitution means to produce a result through execution of one or more steps of a series of said function substitutions.

4,447,876

EMULATOR CONTROL SEQUENCER

Wayne A. Moore, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

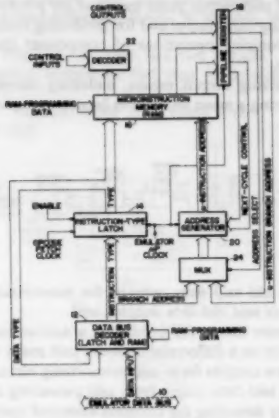
Filed Jul. 30, 1981, Ser. No. 288,255
Int. Cl.[3] G06F 9/44, 5/00
U.S. Cl. 364—200 9 Claims

1. An emulator control sequencer for monitoring an emulator processor data bus, decoding instructions predictive of emulator processor behavior passing thereover from a system processor to said emulator processor, and generating control signals for said emulator processor, comprising:

first decoding means for decoding bytes of instruction data occuring on said data bus to provide instruction-type data words;

a state machine comprising storage means containing a set of instructions in addressable storage locations therein and being responsive to said instruction-type data words to execute said instructions and produce a plurality of control data thereby, and address generator means responsive to at least a portion of said plurality of control data for addressing storage locations of said storage means in a predetermined sequence determinable by said instruction-type data words, said state machine receiving an emulator processor clock signal and operating in synchronism therewith; and

second decoding means for decoding at least a portion of said plurality of control data thereby to produce said



control signals in response to emulator processor status signals.

4,447,877

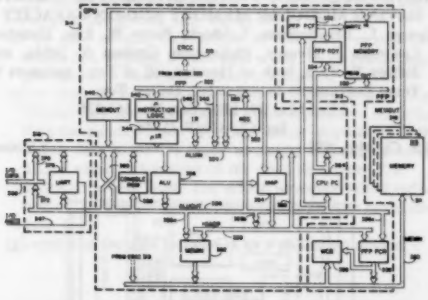
MEMORY BUS INTERFACE SYSTEM

David Grondalski, Hopkinton, Mass., assignor to Data General Corporation, Westboro, Mass.

Division of Ser. No. 959,038, Nov. 8, 1978, Pat. No. 4,316,244. This application Aug. 6, 1981, Ser. No. 290,285

Int. Cl.³ G06F *3/06, 13/00*

U.S. Cl. 364—200 **7 Claims**



1. A digital data bus system useful in a digital computer system including memory means for storing said data and providing said data at a first predetermined time interval after responding to a first memory input signal, said data bus system comprising:

memory input bus means connected to said memory means for conducting said first memory input signal to said memory means;

memory output bus means connected from said memory means for conducting said data provided by said memory means; and

memory bus interface means comprising

generating means connected to said memory input bus means for generating said first memory input signal,

timing means responsive to operation of said generating means for measuring said first predetermined time interval beginning when said generating means has generated said first memory input signal, and

data receiving means connected from said memory output bus means and responsive to operation of said timing means for receiving said data when said timing means indicates passage of said first predetermined time interval.

4,447,878

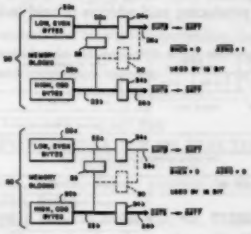
APPARATUS AND METHOD FOR PROVIDING BYTE AND WORD COMPATIBLE INFORMATION TRANSFERS

D. Craig Kinnie, San Jose, and Richard W. Boberg, Los Gatos, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 910,103, May 30, 1978, abandoned. This application Aug. 10, 1981, Ser. No. 291,450

Int. Cl.³ G06F *13/00, 7/00*

U.S. Cl. 364—200 **10 Claims**



1. A circuit for bidirectionally and selectively transferring digital information between at least a first and second bus comprising:

a first means for bidirectionally, and selectively transferring a first portion of said digital information between a first portion of said first and second buses, said first means coupled to said first portion of said first and second buses;

second means for bidirectionally and selectively transferring a second portion of said digital information between a second portion of said first and second buses, said second means coupled to said second portion of said first and second buses; and

swap means for bidirectionally and selectively transferring said second portion of said digital information between said first portion of said second bus and said second portion of said first bus, said swap means coupled between said second portion of said first bus and said first portion of said second bus.

4,447,879

IMPROVED APPARATUS FOR REPRESENTING THE SIZE OF AN ELEMENT IN A COMPOUND DATA ITEM AND DERIVING ADDRESSES AND LENGTHS USING THE ELEMENT SIZE

Anthony S. Fong, Southboro, Mass., assignor to Data General Corporation, Westboro, Mass.

Filed Sep. 11, 1981, Ser. No. 302,263

Int. Cl.³ G06F *9/36*

U.S. Cl. 364—200 **3 Claims**

1. In an improved digital computer system including

(A) memory means for performing memory operations including storing and providing items of data including instructions in response to memory commands, each one of said memory commands specifying one said memory operation and an address of one of said items of data in said memory means, and

(B) Processor means connected to said memory means for providing said memory commands in response to said instructions,

and wherein

said items further include

compound items, each one of said compound items including a plurality of element items, each of said element items in said one compound item having a single size,

index items for selecting said element items in said compound items,

table names representing said compound items, each said table name being associated with a name table entry of said items, said name table entry including

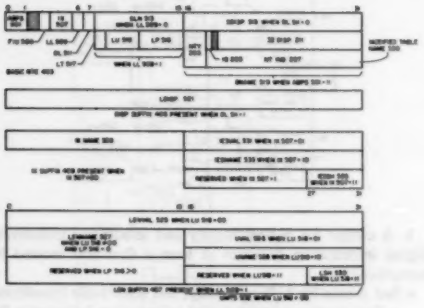
a compound item address specifier specifying said address of said represented compound item,

an index item specifier specifying said address of one of said index items and

an element size specifier specifying said single size,

said instructions contain said table names, and

said processor means includes name processing means responsive to said table names for producing said address of said compound item using said compound item address specifier, producing said address of said index item using



said index item specifier, fetching said index item into said processor means, using said index item and said element size specifier to produce a displacement of said element selected by said index item from said address of said compound item, and adding said displacement to said address of said compound item to produce said address of said element selected by said index item,

the improvements comprising:

(1) an improved said element size specifier in said name table entries associated with said table names representing said compound items having said elements whose said element size is an integer power of two, said element size in said improved element size specifier being specified by means of an integer specifying the exponent of said power of two; and

(2) means in said name processing means responsive to said improved element size specifier for producing said displacement by shifting said index item to the left the number of times specified by said integer in said improved element size specifier.

4,447,880

SYSTEM FOR DETECTING THE TRANSIENT STATE OF ENGINE OPERATION

Yoshiaki Kasai, Kiyose, and Masaaki Ohgami, Musashino, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo and Nissan Motor Co., Ltd., Yokohama, both of, Japan

Filed Jan. 9, 1981, Ser. No. 223,677

Claims priority, application Japan, Jan. 16, 1980, 55-3176

Int. Cl.³ F02P *5/04*; G06F *15/20*

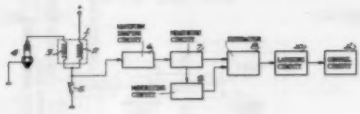
U.S. Cl. 364—431.05 **5 Claims**

1. A system for detecting a transient state of engine operation of an internal combustion engine having a spark ignition system and an air-fuel ratio control system, comprising

a waveform shaping circuit means for producing an output pulse train dependent on an ignition pulse train of said spark ignition system,

a measuring circuit means for measuring each pulse separation of said output pulse train and for producing a corresponding data output and for producing timing pulses for synchronizing operations of component circuits of the system,

a memorizing circuit means, including circuit means for producing a mean value of at least two sequential of most



recent old said data outputs, for memorizing said mean value of said old data outputs, and

a subtractor means for producing a subtraction output dependent on a difference between said mean value of said old data outputs from said memorizing circuit means and a new said data output from said measuring circuit means thereby detecting the transient state and operatively connected to the air-fuel ratio control system to supply the subtraction output to the air-fuel ratio control system for the control thereof.

4,447,881

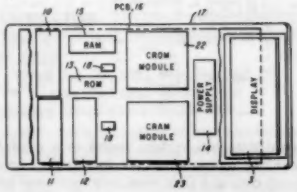
DATA PROCESSING SYSTEM INTEGRATED CIRCUIT HAVING MODULAR MEMORY ADD-ON CAPACITY

George L. Brantingham, Lubbock; Perry W. Lou, Houston; Lawrence J. Housey, Richardson; Graham S. Tubbs, and Jeffrey R. Teza, both of Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 29, 1980, Ser. No. 154,335

Int. Cl.³ G06F *15/46*

U.S. Cl. 364—488 **3 Claims**



1. A method of designing a modular data processing system integrated circuit chip having four sides and including a standard circuit having an arithmetic logic unit, program counter, memory pointers and a permanent section of read/write (RAM) and read only (ROM) memory electrically interconnected by first interconnect means, comprising the steps of:

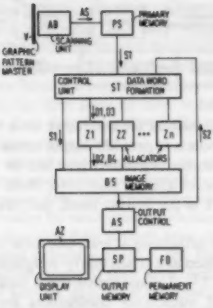
positioning additional ROM and RAM memory circuitry on said chip to supplement the memory requirements of said data processing system, said memory circuitry having a segmented, modular geometry, and

producing second interconnect means to electrically interconnect the additional ROM and RAM memory circuitry with said standard circuitry without disturbing the electrical operation of said standard circuit.

4,447,882
METHOD AND APPARATUS FOR REDUCING GRAPHIC PATTERNS

Joachim Walz, Köngen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 20, 1981, Ser. No. 285,434
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1980, 3036711
Int. Cl.³ G06F *3/14*; G06K *9/00*
U.S. Cl. 364—521 **17 Claims**



1. A method for reducing graphic patterns which are represented by binary characters in rows and columns of a prescribed grid, comprising the steps of:

(a) for each row, combining a plurality m of successive binary characters of a row into a first data word D1;

(b) for each first data word D1, forming a second data word D2 having n binary characters, with the number n being less than the number m and the binary value distribution of the second data word DZ being as similar as possible to the binary value distribution of the first data word D1;

(c) storing the second data words D2;

(d) for each column represented by the stored second data words D2, forming a third data word D3 by combining a plurality k of successive binary characters;

(e) for each third data word D3, forming a fourth data word D4 having l binary characters with the number l being less then the number k and the binary value distribution of the fourth data word D4 being as similar as possible to the binary value distribution of the third data word D3;

(f) storing the data words D4, which now represent a reduction of the original graphic pattern in the same prescribed grid; and

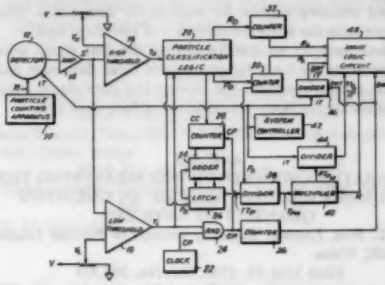
(g) applying the data words D4 to a utilization device.

4,447,883
COINCIDENCE-ERROR CORRECTING APPARATUS AND METHOD

Gregory A. Farrell, Teaneck, N.J., and Edward A. Epstein, Putnam Valley, N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed May 26, 1981, Ser. No. 266,879
Int. Cl.³ G01N *27/00*
U.S. Cl. 364—555 **9 Claims**

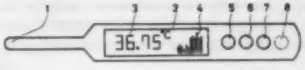
6. In apparatus for the correction of coincidence errors which occur in the detecting and counting of mixed dominant and dominated particles wherein the detectable characteristics of the dominant particles are operable, under coincident dominant-dominated particle detection conditions, to render said dominated particles undetectable, the improvements comprising, means to generate first signals corresponding to the detection of said dominant particles, means to count said first signals corresponding to said dominant particles, means to generate second signals corresponding to the detection of said dominated particles, means to count said second signals corresponding to said dominated particles, means to generate correction signals corresponding to the cumulative time duration for the detection of those of said dominated particles which are detected and counted, and means for correcting the count of said dominated particles in accordance with the cumulative time duration of said correction signals.



4,447,884
GRAPHIC DISPLAY IN AN ELECTRONIC THERMOMETER

Yoshihiro Wada, Ikoma, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 24, 1981, Ser. No. 334,363
Claims priority, application Japan, Dec. 27, 1980, 55-185250
Int. Cl.³ G01K *1/08, 7/20*
U.S. Cl. 364—557 **5 Claims**



1. An electronic thermometer comprising:

temperature sensing means for detecting the body temperature and developing a data signal representing the body temperature;

memory means for storing a said data signal for each of at least five days;

graphic display means for displaying body temperature variations in accordance with said data signals stored in said memory means;

control means for interconnecting said temperature sensing means, said memory means and said graphic display means;

measurement start key means in said control means said detecting operation of the body temperature through the use of said temperature sensing means;

memory key means in said control means for instructing a memorizing operation of said data signal into said memory means;

display key means in said control means for activating said graphic display means to display a temperature corresponding to said data signal;

time period counting means in said control means responsive to actuation of said measurement start key means for counting a time period starting from such actuation;

said control means disabling said temperature sensing means when the time period counted by said time period counting means reaches a predetermined value; and

interruption means responsive to said memory key means and said time period counting means for disabling said temperature sensing means when said memory key means is actuated before said predetermined value is counted by said time period counting means;

said memory means comprising:

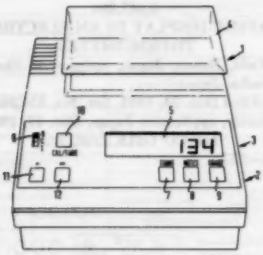
a first memory section for storing the data signal which represents the body temperature of the present day;
a second memory section for storing the data signal which represents the body temperature of one day ago;
a third memory section for storing the data signal which represents the body temperature of two days ago;
a fourth memory section for storing the data signal which represents the body temperature of three days ago; and
a fifth memory section for storing the data signal which represents the body temperature of four days ago.

4,447,885

APPARATUS AND METHOD FOR MEASURING THE NUMBER AND/OR VALUE OF AN UNKNOWN QUANTITY OF ARTICLES

Edgar L. Biss, London, England, assignor to Perkam Limited, Cardiff, Wales

Filed May 19, 1981, Ser. No. 265,326
Claims priority, application United Kingdom, May 20, 1980, 8016677; Nov. 11, 1980, 8036201
Int. Cl.³ G01G *19/42*
U.S. Cl. 364—568 30 Claims



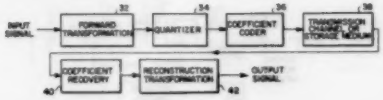
1. A method of measuring the number and/or value of an unknown quantity of articles by use of a weighing and processing apparatus comprising:
entering into the weighing and processing apparatus a record of an average weight factor related to an average unit weight of the articles to be measured;
weighing an unknown quantity of articles;
dividing the total weight of the weighed articles by the said average weight factor to give an actual quotient;
comparing the actual quotient with the nearest ideal quotient to determine whether the actual quotient differs from the nearest ideal quotient by more or less than a predetermined deviation;
as a result of the outcome of the comparison step, carrying out at least one of the following steps, namely
if the actual quotient differs from the nearest ideal quotient by less than a predetermined deviation, the step of indicating the number and/or value of the quantity of articles weighed by means of a signal derived from the said nearest ideal quotient, and
if the actual quotient differs from the nearest ideal quotient by more than the predetermined deviation, the step of indicating a warning that a reliable number and/or value of the quantity of articles weighed cannot be given;
storing in the weighing and processing apparatus information relating to the said unknown quantity of articles,
adding to the said unknown quantity of articles a further unknown quantity of articles, and
repeating in respect of the combined unknown quantities of articles the weighing, dividing, comparing and indicating steps set out above to provide a new actual quotient, but adjusting the items concerned in the comparison step so as to remove from the deviation of the new actual quotient from its nearest ideal quotient the effect of the previous deviation of the first mentioned actual quotient from its nearest ideal quotient.

4,447,886

TRIANGLE AND PYRAMID SIGNAL TRANSFORMS AND APPARATUS

G. William Meeker, 310 Bonifant Rd., Silver Spring, Md. 20904

Filed Jul. 31, 1981, Ser. No. 288,936
Int. Cl.³ G06F *15/332*
U.S. Cl. 364—725 57 Claims



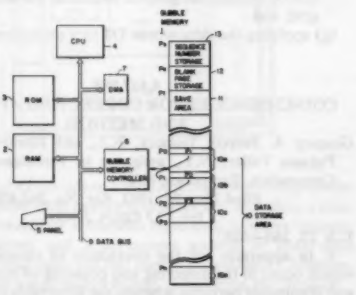
1. A transform method for operating on a one-dimensional set of input data points to provide output terms and coefficients in a transform domain organized into one or more bands, N, where N is an integer greater than zero, Band N is the highest band, and Band 1 is the lowest band, said transform method comprising:
generating and outputting at least one term for Band 1 as a B function defined as a triangularly-weighted average of the values of $2^{N+1}-1$ consecutive input data points;
generating and outputting coefficients for each band as predetermined functions defined as weighted averages of selected consecutive pluralities of input data points, the number of input data points contributing to each coefficient being the least for Band N, and the number of input data points contributing to each coefficient increasing by powers of two for each successive band below Band N, and the predetermined functions being selected so as to enable reconstruction of the values of the input data points from the B-function term for Band 1 and the coefficients for Bands N through 1.

4,447,887

METHOD OF REWRITING DATA IN NON-VOLATILE MEMORY, AND SYSTEM THEREFOR

Ryoji Imazeki, Hachioji, and Michiya Inoue, Hino, both of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Sep. 2, 1980, Ser. No. 183,037
Int. Cl.³ G06F *11/00*
U.S. Cl. 364—900 2 Claims



1. A data rewrite system, operatively connected to received external modification data, for a non-volatile bubble memory having a bubble memory data storage area for storing first data and a bubble memory save area, and including a predetermined pattern, for writing second data in place of the first data stored in the data storage area, the system comprising:
a memory controller, operatively connected to the non-

volatile bubble memory, for performing read and write operations in the non-volatile bubble memory;

a volatile memory, operatively connected to said non-volatile bubble memory, for storing the first data which is read from said non-volatile bubble memory and the second data which is written into said non-volatile bubble memory;

control means, operatively connected to said memory controller, for controlling said memory controller so as to written the first data into the bubble memory save area and erase the second data in the bubble memory data storage area, after a power interruption, said control means comprising:

a direct memory access controller, operatively connected to said memory controller and said volatile memory, for controlling the first and second data transfer between said memory controller and said volatile memory by reading the first data from the bubble memory data storage area, transferring the first data to said volatile memory and writing the first data in said volatile memory into said bubble memory save area;

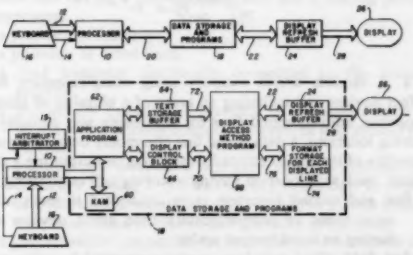
a processor, operatively connected to said direct access controller and operatively connected to receive the external modification data, for controlling said direct memory access controller by determining whether the first data in the bubble memory data storage area corresponds to the predetermined pattern and if so, the first data is written into the bubble memory save area, and for forming and storing the second data in said volatile memory to be written into the bubble memory data storage area in dependence upon the external modification data.

4,447,888

MIXED PITCH DISPLAY

Ward A. Kuecker, Round Rock; Susan D. Stratton, and William C. Cason, both of Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1981, Ser. No. 274,297
Int. Cl.³ G06F *15/02, 3/14*
U.S. Cl. 364—900 **18 Claims**



1. Apparatus for indicating how a mixed pitch presentation of characters will appear on an output device capable of outputting mixed pitch characters, utilizing a display which displays fixed pitch characters, comprising:

means for storing a mixed pitch unformatted data stream to be presented on the display, the data stream containing graphic characters and pitch data for each character,

means for calculating in accordance with said pitch data the starting address for the left margin of each text line to be presented with respect to a fixed reference on said display,

means for building a scale data stream representing a scale line on the display from the pitch data to provide a presentation of the pitch of characters to a user,

means for building a text data stream representing a text presentation on the display from the graphic character data,

a refresh buffer receiving both the scale data stream and the text data stream for generating an output of text lines on said display, said text lines having fixed size characters, and

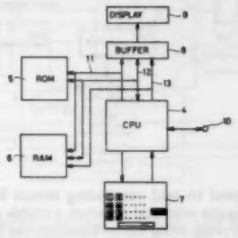
means responsive to movement of a cursor through said lines of text for updating the scale data stream from the pitch data for a cursored text line.

4,447,889

METHOD FOR CONTROLLING DISPLAY OF OUTPUT OF A PROGRAMMABLE DEVICE

Isamu Haneda, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 30, 1981, Ser. No. 279,197
Claims priority, application Japan, Jun. 30, 1980, 55-89774
Int. Cl.³ G06F *3/12, 3/14*
U.S. Cl. 364—900 **4 Claims**



1. A programmable electronic device comprising:

storing means for storing program instructions;

executing means connected to said storing means for executing said program instructions for processing data and;

output means connected to said executing means for outputting program instructions and data processed by said device;

said output means comprising electronic display means, and printing means selectively connectable to said device;

said output means further comprising first means for determining if said printing means is connected to said device; and

second means responsive to said first means for actuating said printing means for outputting data and for permitting said executing means to execute program instructions following said outputting when said printing means is connected to said device, and for actuating said electronic display means and for interrupting operation of said executing means when said printer means is not connected to said device.

4,447,890

REMOTE POSTAGE METER SYSTEMS HAVING VARIABLE USER AUTHORIZATION CODE

Edward C. Duwel, Trumbull, and Howell A. Jones, Jr., Fairfield, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

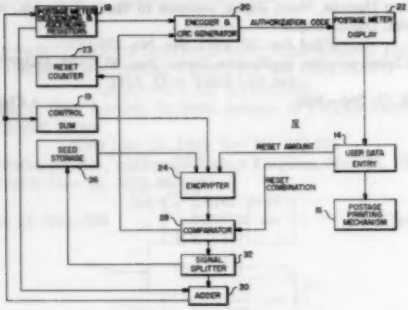
Continuation of Ser. No. 168,932, Jul. 14, 1980. This application Mar. 21, 1983, Ser. No. 476,972
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—900 **14 Claims**

1. A postage meter of the type having printing means for printing postage, and register means for accounting for postage, said register means of the type adapted to be funded with additional postage, and data entry means for entering data into said meter of a selected, variable amount of postage in preparation for funding said register means with that amount and of an externally generated combinations, the improvement comprising:

Means for generating a unique combination which varies as

a function of said selected, variable postage amount entered by said data entry means;

Means coupled to said combination generating means and said data entry means for comparing combinations generated by said combination generating means and externally generated combinations entered by said data entry means, to determine if a predetermined relationship exists between said combination generated by said combination generating means and said externally generated combination entered by said data entry means;



Means coupled to said comparing means for funding said register means with said selected, variable postage amount when said comparing means indicates the existence of said predetermined relationship between said combination generated by said combination generating means and said externally generated combination entered by said data entry means; and

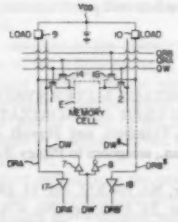
Means coupled to said comparing means for generating an authorization code, each authorization code generated by said authorization code generating means being a function of the number of times said register means have been funded with additional postage.

4,447,891

SIMULTANEOUS READ-WRITE IGFET MEMORY CELL

Hiroshi Kadota, Toyonaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 23, 1981, Ser. No. 304,942
Claims priority, application Japan, Sep. 26, 1980, 55-134897
Int. Cl.³ G11C *7/00, 11/40*
U.S. Cl. 365—154 **2 Claims**



1. A circuit for a unit cell of a random-access memory coupled to first and second complementary write-only data lines, a read-only data line, a write-only address line and a read-only address line, comprising:

a bistable circuit comprising two cross-coupled insulated-gate field-effect transistors, said bistable circuit having first and second complementary input/output nodes;

write data line switching means comprising first and second insulated-gate field-effect transistors,

said first transistor having main electrodes connected between said first input/output node and said first write-only data line, and a gate electrode connected to said write-only address line,

said second transistor having main electrodes connected between said second input/output node and said second write-only data line, and a gate electrode connected to said write-only address line;

a driver circuit for supplying write data to said write-only data lines;

a load means and a detector circuit connected to said read-only data line;

means for maintaining said read-only data line at a potential higher than a threshold potential below which data can be stored in said bistable circuit, so that data cannot be written into said unit cell via said read-only data line;

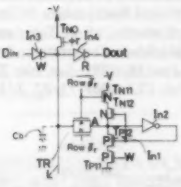
read data line switching means comprising a third insulated-gate field-effect transistor having main electrodes connected between said first input/output node and said read-only data line, and a gate electrode connected to said read-only address line.

4,447,892

PRE-CHARGE FOR THE BIT LINES OF A RANDOM ACCESS MEMORY

Mitsuo Zibu, Ueno, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 234,840, Feb. 13, 1981, abandoned.
This application Jul. 22, 1983, Ser. No. 516,195
Claims priority, application Japan, Feb. 13, 1980, 55-17068
Int. Cl.³ G11C *7/00, 11/34*
U.S. Cl. 365—156 **3 Claims**



1. A random access memory using complementary field effect devices and including an array of a plurality of storing locations, address signal lines for addressing said plurality of storing locations, a data signal line commonly coupled to said plurality of storing locations for inputting or outputting a data signal, each said location having a storing cell comprising:

first and second inverters cross connected to each other constructed of complementary field effect devices and having an input/output node;

first field effect switching means connected in series with said complementary field effect devices of said first inverter means for inhibiting selection of said storing cell upon receipt of a write signal during a write operation mode;

transmission gate means connected between said input/output node of said storing cell and said data signal line for enabling interconnection therebetween in response to receipt of a selection signal on said address line, said transmission gate means including two complementary parallel connected field effect switching devices, each individually responsive to a complementary state of the signal on said address line;

second field effect switching means serially connected to said complementary field effect devices of said first inverter means opposite said first field effect switching means for inhibiting application of bias power to said first inverter means upon receipt of said selection signal ap-

plied to a control termina! of said second field effect switching means;

write inverter means for presenting data to said storing cell during the write mode;

read inverter means for directing data from said storing cell during said read mode; and

pre-charge switch means connected to said data signal line for receiving pre-charge signals for pre-charging said data signal line prior to a reading operation mode of said random access mamory.

4,447,893

SEMICONDUCTOR READ ONLY MEMORY DEVICE

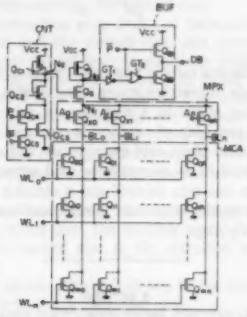
Jyoji Murakami, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 27, 1981, Ser. No. 287,130

Claims priority, application Japan, Jul. 31, 1980, 55-105882

Int. Cl.³ G11C *7/00*

U.S. Cl. 365—203 **4 Claims**



1. A semiconductor read only memory device operatively connectable to receive a clock signal, connected to a voltage source and having a preparation period and a reading period, comprising:

a plurality of bit lines;

a plurality of word lines;

a load transistor electrically connected to the voltage source;

a multiplexer including a plurality of transistors each of which is elelctrically connected to one of said plurality of bit lines;

a memory cell array in which each memory cell has one transistor having a gate electrically connected to one of said plurality of word lines and a source or a drain electrically connected to one of said plurality of bit lines;

a gate transistor connected between said load transistor and said multiplexer; and

gate voltage control means, connected to said gate transistor and operatively connectable to receive the clock signal which indicates whether the memory device is in the preparation period or the reading period, for selectively providing, to the gate of said gate transistor, a first level signal during the preparation period and a second level signal during the reading period.

4,447,894

SEMICONDUCTOR MEMORY DEVICE

Yoichi Imamura, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 28, 1981, Ser. No. 334,621

Claims priority, application Japan, Dec. 29, 1980, 55-188141

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—219 **11 Claims**

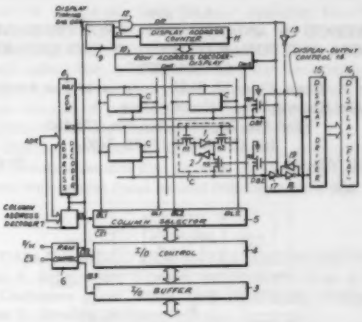
1. A semiconductor memory device having a memory cell comprising:

first and second word selecting lines, said word selecting lines being independent of each other;

first and second gated transistors having gates commonly driven by said first word selecting line;

a bi-stable memory element connected between said first and second transistors;

first, second and third bit lines, said first and second bit lines transmitting mutually inverse data bits for input to said bi-stable memory element through the source/drain terminals of said first and second transistors respectively when



said first word selecting line drives said first and second transistor gates;

a third gated transistor for selectively connecting an output terminal of said bi-stable memory element to said third bit line, said third transistor being selected for outputting data from said bi-stable memory element when driven by said second word selecting line,

an address selected by said second word selecting line for output of data from said bi-stable memory means being independent of an address selected for input of data to said bi-stable memory element by said first word selecting line.

4,447,895

SEMICONDUCTOR MEMORY DEVICE

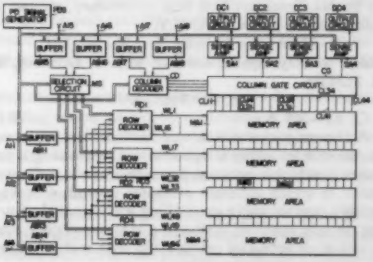
Masamichi Asano, Tokyo, and Hiroshi Iwahashi, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 30, 1980, Ser. No. 192,203

Claims priority, application Japan, Oct. 4, 1979, 54-128392; Nov. 5, 1979, 54-143104

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—226 **5 Claims**



1. An address designation circuit responsive to externally-generated address signals comprising:

a plurality of first decoding circuits coupled to said address signals;

a plurality of second decoding circuits coupled to said address signals;

a plurality of buffer circuits each having a power receiving path and including a plurality of buffers which have first and second input terminals, said first input terminals of all said buffers in each buffer circuit being connected to a different one of said plurality of said first decoding circuits and said second input terminals being connected to said plurality of second decoding circuits; and

power-down means connected to said power receiving paths of said plurality of buffer circuits for selectively interrupting said power receiving paths.

4,447,896

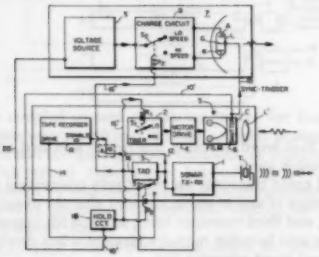
METHOD OF AND APPARATUS FOR COMBINED OPTICAL AND SONAR DETECTION AND RECORDING OF OBJECTS

Robert H. Rines, Concord, N.H., assignor to The Academy of Applied Science, Inc., Belmont, Mass.

Filed Jun. 26, 1981, Ser. No. 277,655

Int. Cl.³ G01S *15/88, 7/60*

U.S. Cl. 367—96 **29 Claims**



1. A method of combined optical and acoustical recording, that comprises, repetitively activating an optical device and thereby periodically optically monitoring an underwater sector and recording the scenes therein at the times of said monitoring; acoustically monitoring said sector at least at said times and recording the monitored acoustical information in said sector; analyzing the acoustical information to determine if and when a predetermined acoustical pattern has been monitored; and, upon detecting the advent of such monitored predetermined pattern, changing the periodicity of said activating for so long as said acoustical pattern continues to be monitored.

4,447,897

PRE-ASSEMBLED TWO-STAGE REACTION DEVICE FOR VACUUM BRAKE BOOSTERS

Peter Boehm, Frankfurt, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed May 21, 1982, Ser. No. 380,504

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1981, 3135286

Int. Cl.³ F15G *9/10*

U.S. Cl. 91—369 B **20 Claims**

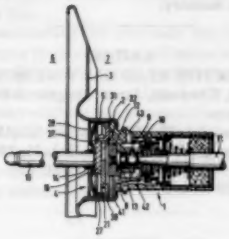
1. A two-stage reaction device for insertion into a vacuum brake booster including a movable wall separating a vacuum chamber in which a constant pressure prevails and a working chamber in which different pressures prevail, a brake pedal actuatable control valve controlling a differential of pressure acting on said movable wall and a master cylinder actuating push rod in an actuating relationship with said movable wall, said reaction device comprising:

a pair of reaction levers each aligned to be coupled to said movable wall on a first location thereof and in engagement with a reaction plate connected to said push rod at a second location thereon, said first location being disposed radially farther out than said second location;

a cup spring acting on each of said pair of reaction levers at a third location thereon having a greater radius than said first location, said cup spring being disposed on a side of said pair of reaction levers adjacent said vacuum chamber;

a spring plate disposed between said cup spring and said pair of reaction levers, said spring plate having a circumferential collar provided with supporting surfaces for said pair of reaction levers; and

a supporting ring having two inward supporting edges each abutting a different one of said pair of reaction levers on a



surface thereof remote from said reaction plate, inner ends of said pair of reaction levers being tiltable about said two supporting edges in a direction of said control valve, wherein said pair of reaction levers, said push rod with said reaction plate, said spring plate and said cup spring are retained in an assembly by said supporting ring disposed on one side thereof and a circular guide element disposed on the other side thereof and connected to said supporting ring.

4,447,898

SIMPLIFIED SOUND REPRODUCING DEVICE DRIVEN BY A SPRING MOTOR

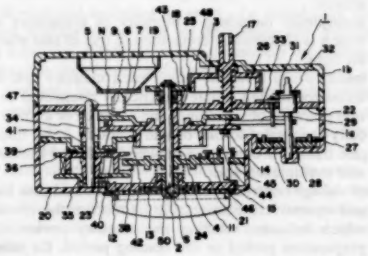
Eishi Koike, Sagamikara, Japan, assignor to Ozen Corporation, Tokyo, Japan

Filed Mar. 1, 1982, Ser. No. 353,612

Claims priority, application Japan, Nov. 30, 1981, 56-192393

Int. Cl.³ G11B *27/10, 3/78*

U.S. Cl. 369—65 **6 Claims**



1. A sound reproducing device comprising:

a casing;

a center pin mounted upright within the casing;

a record disc having a recorded face thereon with starting and end points of reproduction;

a turntable supported on and axially movable between advanced and retracted positions on the center shaft, the turntable carrying the record disc;

a speaker cone disposed within the casing;

a vibrating plate mounted on the bottom of the speaker cone;

a pickup mounted within the casing for lateral and vertical swinging movement between the vibrating plate and the

record disc, the pickup having an upper face capable of slidingly contacting the vibrating plate;

a recording stylus mounted on the pickup and capable of engaging the recorded face of the record disc;

first means for biasing the turntable and the record disc toward the vibrating plate to impart stylus pressure to the reproducing stylus;

second means for biasing the pickup toward both the starting point of sound reproduction on the record disc and away from the recorded face of the record disc;

a winding knob supported on the center shaft and axially movable with respect to the center shaft, the winding knob being movable between winding and retracted directions;

a winding gear wheel capable of being coupled with the winding knob in the direction of winding of the winding knob and axially movable together with the winding knob along the center shaft;

third means for biasing the winding knob and the winding gear wheel toward the retracted direction;

a locking piece integrally formed on the turntable opposite from the side carrying the record disc;

a slippage preventing pole disposed between the winding gear wheel and the record disc and advanced by the winding gear wheel into engagement with the locking piece, the slippage preventing pole being retracted by pushing movement of the record disc when the record disc is in the retracted position and released from engagement with the locking piece when the record disc advances toward the reproducing stylus;

a starting post disposed parallel to the center shaft within the casing;

fourth means for normally biasing the starting post away from the record disc, the starting post being capable of moving the record disc to the retracted position when depressed;

transmission means disposed on top of the center shaft and rotatable with the record disc; and

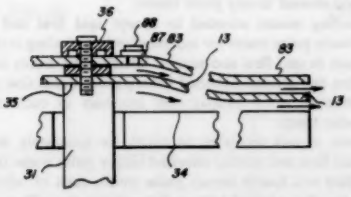
transmission follower means fixedly attached to the starting post and coupled to the transmission means to enable the starting post to function as a rotatable output shaft.

4,447,899

OPTICAL DISC METHOD, MEDIA AND APPARATUS FOR WRITING AND/OR READING INFORMATION

Frederick F. Geyer, Rochester, and Dennis G. Howe, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 18, 1980, Ser. No. 160,769
Int. Cl.³ G11B *7/00, 25/04*
U.S. Cl. 369—111 **26 Claims**



1. A method of optically writing and/or reading high-density information, said method comprising:

(1) positioning an optical disc unit, including (i) a flexible record disc which is generally flat and of generally uniform thickness and (ii) a transparent, flexible, cover disc which: (a) is generally flat and generally uniform in thickness, (b) has a shape corresponding to said record disc and (c) has a central portion that is secured in a fixed, parallel and predeterminedly spaced relation with respect to a corresponding central portion of said record disc, with the planes of said central portions in planes substantially normal to an axis of rotation and with the outer portion of said record disc closely adjacent a highly smooth, featureless stabilizing reference surface that is axially symmetric to said axis of rotation and generally non-convex to said normal planes;

(2) maintaining said reference surface stationary and said central disc portions in said plane while rotating said disc about said axis at a high speed which flys said record disc outer portion in closely spaced opposing relation to said stabilizing reference surface and flys said cover disc outer portion in spaced relation to the opposing record disc outer portion;

(3) coupling a radially central region of: (i) the zone between said record disc and said stabilizing reference surface and (ii) the zone between the record disc and the cover disc, to gas sources of pressure not substantially exceeding the ambient pressure external of said zones; and

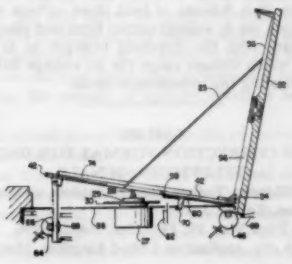
(4) directing a beam of light for writing and/or reading information on said disc through said rotating cover disc and into precise focus on said rotating record disc.

4,447,900

AUTOMATIC VIDEO DISC INVERTING MECHANISM

Etienne A. Schatteman, Wemmel, and Stephane M. A. d'Alayer de Costemore d'Arc, Ways, both of Belgium, assignors to Staar S, Brussels, Belgium

Filed Feb. 23, 1982, Ser. No. 351,410
Claims priority, application Belgium, Apr. 17, 1981, 888484; Nov. 16, 1981, 891132
Int. Cl.³ G11B *17/04, 1/00*
U.S. Cl. 369—200 **22 Claims**



1. In a video disc player apparatus having a base, means on the base for rotating a video disc, and a protective cover pivotally hinged on the base and forming therewith an enclosure for a video disc on said rotating means, and adapted to be opened and closed by pivotal movement to permit a disc to be inserted in or removed from said enclosure, the improvement comprising:

a device for automatically turning over a disc carried by said rotating means, said device including:

means associated with said cover for engaging and pivoting the disc about its bottom edge between substantially horizontal and vertical positions as an incident to pivotal movement of the cover;

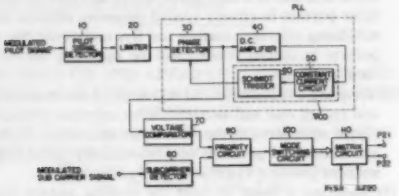
the turning over including a ninety degree phase in which the disc slides under its own weight between substantially vertical and horizontal positions while the bottom edge of the disc slides laterally and a ninety degree phase in which the disc pivots about said bottom edge between substantially horizontal and vertical positions; and

means for guiding both said bottom edge and the top edge of the disc during its sliding movement and for supporting the bottom edge of the disc for pivotal movement about an axis adjacent the pivotal axis of said cover.

4,447,901
MODE DISCRIMINATION CIRCUIT

Kozo Yoshihisa, Fukaya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 26, 1982, Ser. No. 362,519
Claims priority, application Japan, Mar. 31, 1981, 56-48070
Int. Cl.³ H04J 1/06; H04H 5/00; H04M 1/32
U.S. Cl. 370—74 9 Claims



1. A mode discrimination circuit comprising:

means for detecting a pilot signal which is transmitted for discriminating a transmission mode of a composite transmission signal;

means for generating an oscillation signal having an oscillation frequency determined depending upon an input voltage;

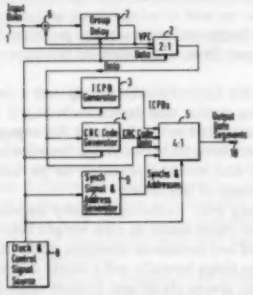
phase comparing means for comparing frequencies and phases of the oscillation signal from said generating means and the pilot signal from said detecting means so as to output a dc voltage signal proportional to a difference therebetween, the dc voltage being supplied to said generating means as the input voltage; and

voltage comparing means having at least two threshold voltages, thus defining at least three voltage ranges, for comparing the dc voltage output from said phase comparing means with the threshold voltages so as to detect within which voltage range the dc voltage falls, thereby discriminating the transmission mode.

4,447,902
ERROR-CORRECTION FORMAT FOR DIGITAL TELEVISION SIGNALS

James H. Wilkinson, Tadley, United Kingdom, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 19, 1982, Ser. No. 359,996
Claims priority, application United Kingdom, Mar. 23, 1981, 8108998
Int. Cl.³ G06F 11/10
U.S. Cl. 371—39 10 Claims



1. A method of transmitting digital television signals comprising the steps of:

forming data words representing a digital television signal into successive data segments, each said data segment comprising a plurality of data blocks, each said data block comprising a plurality of data sub-blocks, and each said data sub-block comprising a plurality of said data words;

generating a respective first error correcting code for each said data sub-block for correcting at least one bit which may be in error in said data sub-block;

generating a respective error detecting code for each said data block for detecting whether said first error correcting code has corrected all errors in said respective data block;

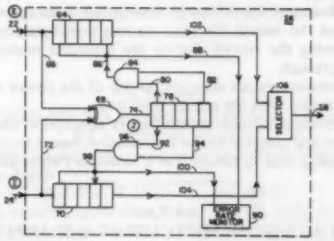
generating a respective second error correcting code for each said data segment for correcting at least one data word which may be in error in said data segment; and

combining said first and second error correcting codes and said error detecting code into said respective data segments for transmission of said digital television signal.

4,447,903
FORWARD ERROR CORRECTION USING CODING AND REDUNDANT TRANSMISSION

Ake N. Sewerinson, Port Coquitlam, Canada, assignor to AEL Microtel, Ltd., Burnaby, Canada

Filed May 22, 1981, Ser. No. 266,230
Int. Cl.³ G06F 11/00, 11/14
U.S. Cl. 371—68 15 Claims



1. In a digital data transmission system having a transmitting terminal, a receiving terminal, a transmission path connecting the two terminals, and a source of binary data at said transmitting terminal, apparatus for performing forward error correction, which comprises:

means for converting said binary data into redundant first and second binary pulse trains;

encoding means adapted to accept said first and second binary pulse trains for independently encoding said binary data in said first and second binary pulse trains to obtain first and second encoded binary pulse trains that provide different error propagation intervals in each encoded pulse train;

means, at said receiving terminal, for separately decoding said first and second encoded binary pulse trains to obtain third and fourth binary pulse trains, each of which contains the original binary data absent the effect of path error introduction in said transmission path;

means for comparing bit occurrences in said third and fourth decoded binary pulse trains to determine if an error has occurred;

means responsive to a detected error and to subsequently detected errors occurring at said error propagation intervals to determine in which said data channel said path error occurred; and

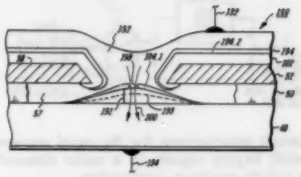
means for correcting the bits in the decoded pulse train in which said errors have occurred.

4,447,904

SEMICONDUCTOR DEVICES WITH NONPLANAR CHARACTERISTICS PRODUCED IN CHEMICAL VAPOR DEPOSITION

Robert D. Burnham, Los Altos Hills, Calif., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 231,556, Feb. 4, 1981. This application Dec. 6, 1982, Ser. No. 446,893
Int. Cl.³ H01S 3/19
U.S. Cl. 372—45 37 Claims



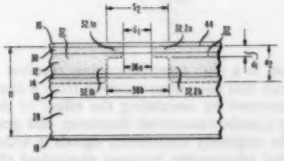
1. In a semiconductor device comprising a plurality of contiguous layers of semiconductor materials deposited on a semiconductor structure, masking means provided during the deposition of at least one of said layers by means of pyrolyzation of vapor mixtures of said semiconductor materials through an aperture in said mask, said at least one of said layers characterized by having a predetermined lateral spatial thickness variation, said lateral spatial thickness variation predetermined in part by the dimensional size and thickness of said mask aperture, the thickest region of said lateral spatial thickness variation being central of said mask aperture.

4,447,905

CURRENT CONFINEMENT IN SEMICONDUCTOR LIGHT EMITTING DEVICES

Richard W. Dixon, Bernardsville; Louis A. Koszi, Scotch Plains; Richard C. Miller, Summit, and Bertram Schwartz, Westfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 25, 1981, Ser. No. 247,523
Int. Cl.³ H01S 3/19
U.S. Cl. 372—46 13 Claims



1. In a semiconductor light emitting device, a semiconductor body comprising

an active region in which optical radiation is generated when current flows therethrough, and

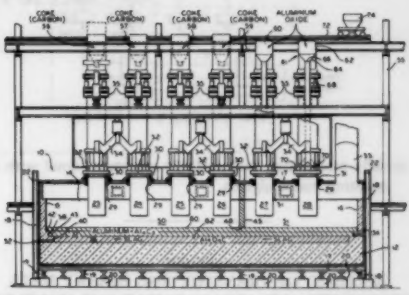
means within said body for constraining said current to flow from a surface of said body in a channel through said active region, said channel being narrow near said surface and wider near said active region.

4,447,906

ARC FURNACE FOR PRODUCING ALUMINUM

John A. Persson, Gibsonia, Pa., assignor to Lectromelt Corporation, Pittsburgh, Pa.

Division of Ser. No. 230,629, Feb. 2, 1981, Pat. No. 4,385,930. This application Jul. 6, 1982, Ser. No. 395,807
Int. Cl.³ H05B 3/42
U.S. Cl. 373—72 3 Claims



1. An electric arc furnace having a hearth, side and end walls and a roof to define a furnace chamber,

said roof having a plurality of spaced apart apertures,

a plurality of electrodes, one of said electrodes extending through each aperture,

a partition in said furnace, said partition extending downwardly from said roof and between said side walls to divide said furnace into first and second zones,

the lower end of said partition being spaced above said hearth and said hearth being unobstructed between said end walls to permit molten material and slag having different densities to flow at all levels in the gap between said partition and said hearth and between said zones but preventing the passage of gaseous products between said zones,

first and second groups of said plurality of electrodes extending into each zone,

a first tap hole extending through one of said side walls and at a first elevation above said hearth but below the level of said partition and a second tap hole extending through the other of said side walls and between the level of said first tap hole and said partition whereby different molten materials may be removed through each tap hole,

the hearth in said first zone consisting primarily of a carbonaceous refractory material and the hearth in said second zone consisting primarily of an aluminum oxide refractory.

4,447,907

MULTIPLE MIXER SPREAD SPECTRUM MODULATION AND METHOD THEREFOR

John E. Bjornholt; Richard G. Foster, both of Mesa, and Edward J. Groth, Jr., Scottsdale, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jan. 11, 1982, Ser. No. 338,782
Int. Cl.³ H04B 15/00
U.S. Cl. 375—1 6 Claims

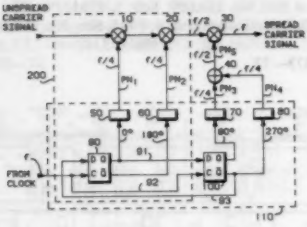
6. A method of modulating an unspread signal to obtain a spread spectrum signal comprising the steps of;

providing a plurality of phased coded signals;

serially modulating said unspread signal with a first portion of said plurality of coded signals creating a partially unspread signal;

combining a subsequent portion of said plurality of coded

signals through a sequence of logic gates creating a resulting coded signal; and



serially modulating said partially unspread signal with said resulting coded signals.

4,447,908

METHOD OF TRANSMITTING BINARY DATA SEQUENCES AND ARRANGEMENT FOR ENABLING THE RAPID DETERMINATION OF THE END OF A TRANSMITTED BINARY DATA SEQUENCE

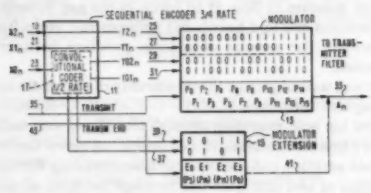
Pierre R. Chevillat, Adliswil, and Gottfried Ungerboeck, Langnau, both of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 3, 1981, Ser. No. 327,006

Claims priority, application European Pat. Off., Dec. 23, 1980, 80 108 156.3

Int. Cl.³ H04L *27/18*

U.S. Cl. 375—42 **4 Claims**



1. A method of transmitting input binary data sequences in the form of transmission symbols represented by modulation states of a carrier signal at discrete sampling times, said method comprising the steps of

encoding said input binary data sequence in a sequential encoder (11) having n integral number internal states and furnishing an encoded bit group at each sampling time, reflecting the input data and the internal state at said sampling time,

transmitting in response to each encoded bit group one associated transmission symbol from a given set of transmission symbol (P0...P15) which is subdivided into disjoint subsets, the subset of which the transmitted symbol is a member being associated to said internal encoder state and ending said transmission by,

transmitting one escape symbol from a set of escape symbols (E0...E3) which is a further subset of the set of transmission symbols, comprising selected transmission symbols of said disjoint subsets, the transmitted escape symbol being dependent on the internal encoder state but being not a member of any of the transmission symbol subsets usually associated with said internal encoder state, and

transmitting an unmodulated carrier or no carrier signal at all after said escape symbol is transmitted.

4,447,909

CIRCUIT FOR RAPID RECOGNITION OF FSK SIGNALS IN A RADIO CHANNEL

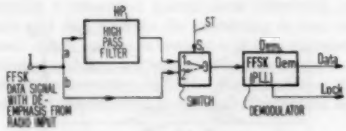
Hans Hjorring, Sfrömmen, Norway, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 17, 1982, Ser. No. 379,129

Claims priority, application Fed. Rep. of Germany, May 25, 1981, 3120761

Int. Cl.³ H03K *9/06*

U.S. Cl. 375—88 **1 Claim**



1. A circuit arrangement for the rapid recognition of frequency shift keying signals in a radio channel given pre-emphasis and de-emphasis, comprising:

a fast frequency shift keying demodulator including an input, a data output and a lock output;

said demodulator including a phase locked loop circuit;

a circuit input for receiving the fast frequency keyed signals;

a first branch connected to circuit input and including a high-pass filter having a structure to provide a cutoff frequency which lies above the upper cutoff frequency of the audible channel, and a second branch connected to said circuit input; and

a switch including first and second inputs, and an output connected to said input of said fast frequency keying demodulator, said first input connected to said high-pass filter and said second input connected to said second branch for directly receiving said fast frequency shift keyed signals from said circuit input.

4,447,910

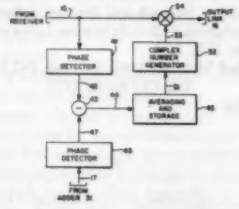
PHASE TRACKING CORRECTION SCHEME FOR HIGH FREQUENCY MODEM

Earl F. Smith, Melbourne, and Daniel D. McRae, West Melbourne, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jun. 2, 1981, Ser. No. 269,607

Int. Cl.³ H04M *3/18*

U.S. Cl. 375—99 **17 Claims**



1. For use in a data communications receiver apparatus in which signals that have been received from a dispersive channel are processed by simulating the effect of the dispersive channel on signals transmitted thereover and generating estimates of the originally transmitted signals in accordance with a preselected relationship between prescribed characteristics of the simulated effect of the dispersive channel and the received signals, an arrangement for compensating for the effect of rapid phase changes of said channel on the received signals comprising:

first means for measuring the average difference in phase between generated estimates of the received signals and actually received signals; and

second means for modifying the values of the actually received signals to be employed in generating estimates of the originally transmitted signals based upon said average difference in phase as measured by said first means.

DESIGN PATENTS

GRANTED MAY 8, 1984

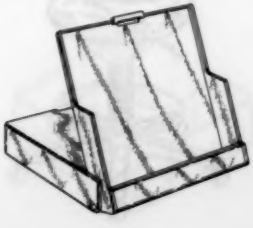
ERRATA

For CLASS	See PATENT NO.
D28–064	273,808

273,719
SKI BOOT
Alessandro Pozzobon, Treviso, Italy, assignor to NORDICA S.p.A., Montebelluna, Italy
Filed May 4, 1981, Ser. No. 260,157
Claims priority, application Italy, Feb. 11, 1980, 20760B/80
Term of patent 14 years
U.S. Cl. D2—276

273,720
NECKTIE FASTENER
Warren O. Romberger, 904 NW. 59th St., Oklahoma City, Okla. 73118
Filed Feb. 18, 1982, Ser. No. 350,083
Term of patent 14 years
U.S. Cl. D2—401

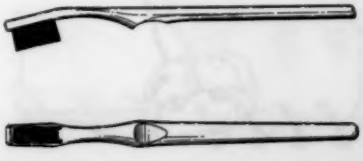
273,721
FLOPPY DISK HOLDER
Peter A. Ronzani, Los Gatos, Calif., assignor to Quiet Designs, Inc., Santa Clara, Calif.
Filed Oct. 19, 1981, Ser. No. 312,638
Term of patent 14 years
U.S. Cl. D3—35



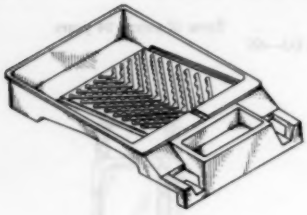
273,722
KEY RING
Attilio Brentini, c/o Lanaa SA, chemin du Croset 9, 1024 Ecublens, Switzerland
Filed Sep. 2, 1981, Ser. No. 298,823
Claims priority, application Switzerland, Mar. 13, 1981, 111 653
Term of patent 14 years
U.S. Cl. D3—65

273,723
ELECTRIC TOOTHBRUSH HOLDER
Hiroshi Hukuba, Nagareyama, and Nobuji Nakamura, Chofu, both of Japan, assignors to Hiroshi Hukuba, Nagareyama, Japan
Filed Dec. 21, 1981, Ser. No. 332,997
Claims priority, application Japan, Jun. 21, 1981, 56-26932
Term of patent 14 years
U.S. Cl. D4—15

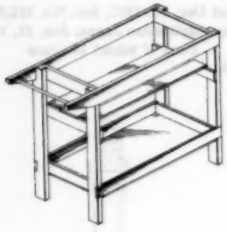
273,724
TOOTHBRUSH
Louis S. Gillow, 201 Tabor Rd., Morris Plains, N.J. 07950
Filed Sep. 29, 1982, Ser. No. 426,565
Term of patent 14 years
U.S. Cl. D4—25



273,725
TRAY
Charles R. Goetz, Pittsburgh, Pa., assignor to Stylette Plastics, Inc., Oakdale, Pa.
Filed Sep. 14, 1981, Ser. No. 301,637
Term of patent 14 years
U.S. Cl. D4—38.2



273,726
BABY BATHTUB STAND
Luis Valenzuela, 36 Meadow Glen, Brownville, Tex. 78520
Filed Oct. 8, 1981, Ser. No. 309,713
Term of patent 14 years
U.S. Cl. D6—5



273,727
BABY SEAT
Shinroku Nakao, Kanagawa; Yoshiyasu Ishii, and Hiroaki Matsuda, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Sep. 1, 1981, Ser. No. 298,394
Claims priority, application Japan, Mar. 2, 1981, 56-8365; Mar. 2, 1981, 56-8369; Mar. 2, 1981, 56-8370
Term of patent 14 years
U.S. Cl. D6—7

273,728
CHAIR
Vincent Cafiero, Irvington, N.Y., assignor to Simmons Universal Corporation, New York, N.Y.
Filed Nov. 12, 1981, Ser. No. 320,781
The portion of the term of this patent subsequent to May 1, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—30

273,729
CHAIR
Charles W. Pelly, Calabasas, and John Krieger, Palos Verdes Estates, both of Calif., assignors to Unitek Corporation, Monrovia, Calif.
Filed Feb. 12, 1982, Ser. No. 348,568
Term of patent 14 years
U.S. Cl. D6—30

273,730
ARM CHAIR
Vincent Cafiero, Irvington, N.Y., assignor to Simmons Universal Corporation, New York, N.Y.
Filed Nov. 12, 1981, Ser. No. 320,810
The portion of the term of this patent subsequent to Apr. 10, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—31

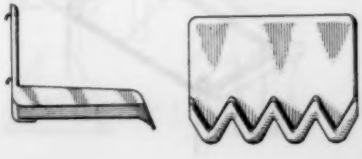
273,731
FOLDABLE SEAT AND TABLE UNIT
Hugo A. Pineiro, Uppstigen 104-41, S-412 80 Göteborg, Sweden
Filed Jul. 31, 1981, Ser. No. 288,920
Claims priority, application Sweden, Feb. 27, 1980, 80-0411
Term of patent 14 years
U.S. Cl. D6—45

273,732
LOUNGE SEAT
H. Robert Tiffany, Chattanooga, Tenn., assignor to Robert Tiffany Designs, Inc., Chattanooga, Tenn.
Filed Nov. 2, 1981, Ser. No. 317,684
Term of patent 14 years
U.S. Cl. D6—47

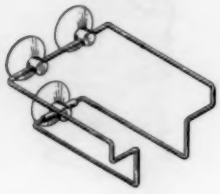
273,733
CHAIR
Mike T. Claman, 475 Park Ave., New York, N.Y. 10022
Filed Jun. 22, 1981, Ser. No. 275,920
Term of patent 14 years
U.S. Cl. D6—57

273,734
CHAIR OR SIMILAR ARTICLE
Herbert C. Saiger, Troy, Ohio, assignor to The Hammock Shop, Inc., Pawleys Island, S.C.
Filed Feb. 23, 1982, Ser. No. 351,683
Term of patent 14 years
U.S. Cl. D6—73

273,735
COLLATING RACK
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Jun. 21, 1982, Ser. No. 390,342
Term of patent 14 years
U.S. Cl. D6—114



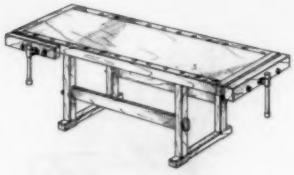
273,736
FLOWER POT HOLDER
Bernard R. Barry, Box 219, Green Mansion Rd., Warrensburg, N.Y. 12885
Filed Jul. 2, 1982, Ser. No. 394,662
Term of patent 14 years
U.S. Cl. D6—130



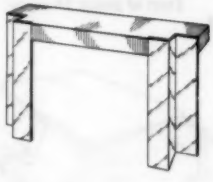
273,737
TABLE
Leon Rosen, Scarsdale, N.Y., assignor to The Pace Collection, Inc., Long Island City, N.Y.
Filed Aug. 5, 1981, Ser. No. 290,207
Term of patent 14 years
U.S. Cl. D6—146

273,738
TABLE
Bruce Keiser, Phildelphia, Pa., assignor to Keiser Sterling Corporation, Phildelphia, Pa.
Filed Feb. 25, 1982, Ser. No. 352,272
Term of patent 14 years
U.S. Cl. D6—175

273,739
WORK BENCH
Peter D. Shapiro, 2143 Canyon Dr., Los Angeles, Calif. 90068
Filed Nov. 5, 1981, Ser. No. 318,384
Term of patent 14 years
U.S. Cl. D6—177

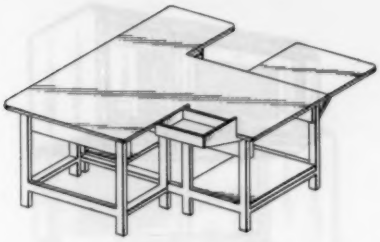


273,740
WALL TABLE
Leon Rosen, Scarsdale, N.Y., assignor to The Pace Collection, Inc., Long Island City, N.Y.
Filed Mar. 1, 1982, Ser. No. 353,086
Term of patent 14 years
U.S. Cl. D6—177

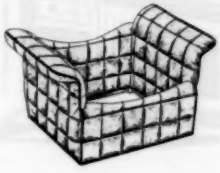


273,741
ADJUSTABLE TABLE
Thomas Koves, 645 N. Cherokee Ave., Los Angeles, Calif. 90004
Filed Feb. 16, 1982, Ser. No. 348,813
Term of patent 14 years
U.S. Cl. D6—178

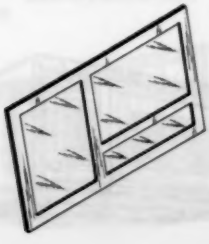
273,742
COMPUTER TABLE
Jo Ann Cunningham, Glen Burnie; Catherine A. Gilliss, Lansdowne, and Patricia M. Gorzo, Baltimore, all of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Mar. 19, 1982, Ser. No. 360,111
Term of patent 14 years
U.S. Cl. D6—179



273,743
SEAT FRAME
Gillis L. A. Lundgren, Lönashult, Sweden, assignor to Inter-Ikea A/S, Humlebaek, Denmark
Division of Ser. No. 80,166, Sep. 28, 1979. This application Feb. 12, 1982, Ser. No. 348,188
Claims priority, application Denmark, Mar. 28, 1979, 269/79
Term of patent 14 years
U.S. Cl. D6—191



273,744
PICTURE FRAME
Richard M. Castillo, 13040 Tom White Way, Ste. #L, Norwalk, Calif. 90650
Filed Nov. 9, 1981, Ser. No. 319,484
Term of patent 14 years
U.S. Cl. D6—234



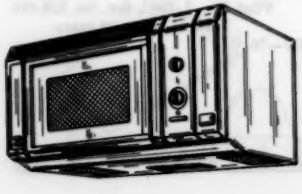
273,745
DRINKING VESSEL
Vivienne D. Jagger, St. Ives, Australia, assignor to Little People Limited, Hong Kong, Hong Kong
Filed Sep. 3, 1981, Ser. No. 298,923
Claims priority, application United Kingdom, Mar. 18, 1981, 81999510
Term of patent 14 years
U.S. Cl. D7—9

273,746
TACO HOLDER
Dale A. Hunt, 7940 Sunfield Ct., Indianapolis, Ind. 46224
Filed Dec. 7, 1981, Ser. No. 328,416
Term of patent 14 years
U.S. Cl. D7—76

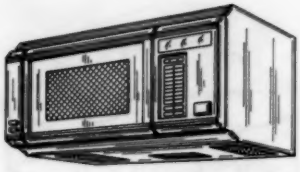
273,747
MICROWAVE OVEN
Kenichi Haruguchi; Takao Miyake; Masayoshi Kawaishi; Masafumi Numano, and Kazuo Tsujimoto, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jan. 22, 1982, Ser. No. 341,662
Claims priority, application Japan, Jul. 23, 1981, 56-32866
Term of patent 14 years
U.S. Cl. D7—351

273,748
MICROWAVE OVEN
Kenichi Haruguchi; Takao Miyake; Masayoshi Kawaishi; Masafumi Numano, and Kazuo Tsujimoto, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jan. 22, 1982, Ser. No. 341,667
Claims priority, application Japan, Jul. 23, 1981, 56-32865
Term of patent 14 years
U.S. Cl. D7—351

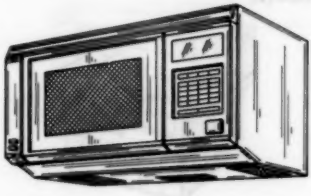
273,749
MICROWAVE OVEN
Kenichi Haruguchi; Takao Miyake; Masayoshi Kawaishi; Masafumi Numano, and Kazuo Tsujimoto, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Feb. 22, 1982, Ser. No. 351,039
Claims priority, application Japan, Aug. 25, 1981, 56-37864
Term of patent 14 years
U.S. Cl. D7—351



273,750
MICROWAVE OVEN
Kenichi Haruguchi; Takao Miyake; Masayoshi Kawaishi; Masafumi Numano, and Kazuo Tsujimoto, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Feb. 22, 1982, Ser. No. 351,040
Claims priority, application Japan, Aug. 25, 1981, 56-37865
Term of patent 14 years
U.S. Cl. D7—351



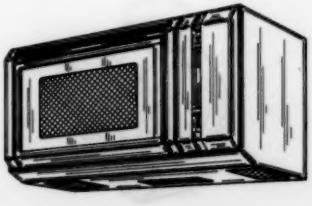
273,751
MICROWAVE OVEN
Kenichi Haruguchi; Takao Miyake; Masayoshi Kawaishi; Masafumi Numano, and Kazuo Tsujimoto, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Feb. 22, 1982, Ser. No. 351,227
Claims priority, application Japan, Aug. 25, 1981, 56-37863
Term of patent 14 years
U.S. Cl. D7—351



273,752
MICROWAVE OVEN
Kenichi Haruguchi; Takao Miyake; Masayoshi Kawaishi; Masafumi Numano, and Kazuo Tsujimoto, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Feb. 22, 1982, Ser. No. 351,228
Claims priority, application Japan, Aug. 25, 1981, 56-37879
Term of patent 14 years
U.S. Cl. D7—351

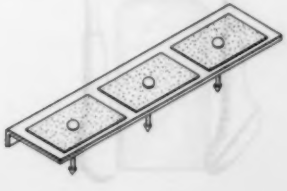
273,753
MICROWAVE OVEN
Kenichi Haruguchi; Takao Miyake; Masayoshi Kawaishi; Masafumi Numano, and Kazuo Tsujimoto, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Feb. 22, 1982, Ser. No. 351,234
Claims priority, application Japan, Aug. 25, 1981, 56-37878
Term of patent 14 years
U.S. Cl. D7—351

273,754
MICROWAVE OVEN
Kenici Haruguchi; Takao Miyake; Masayoshi Kawaishi; Masafumi Numano, and Kazuo Tsujimoto, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Feb. 24, 1982, Ser. No. 351,661
Claims priority, application Japan, Aug. 25, 1981, 37880/1981
Term of patent 14 years
U.S. Cl. D7—351

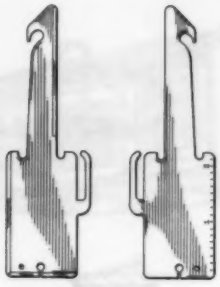


273,755
COVERED FRYING PAN OR SIMILAR ARTICLE
Heida Thurlow, c/o Lentrade, Inc., 10649 Haddington, Suite 120, Houston, Tex. 77043
Filed Dec. 11, 1981, Ser. No. 329,933
Term of patent 14 years
U.S. Cl. D7—359

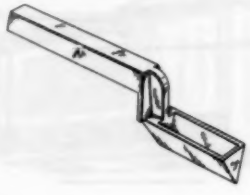
273,756
PATTERNED LAWN TRIM STRIP FASTENING DEVICE
Thomas A. Rexroth, 522 Melville, West Burlington, Iowa 52655
Filed Apr. 30, 1982, Ser. No. 373,711
Term of patent 14 years
U.S. Cl. D8—1



273,757
MULTI-PURPOSE TOOL FOR CAN PULL-TABS, SLIDE FASTENERS, OR THE LIKE
Homer E. Evans, 2107 N. 70th Pl., Scottsdale, Ariz. 85257
Filed Nov. 9, 1981, Ser. No. 319,306
Term of patent 14 years
U.S. Cl. D8—18

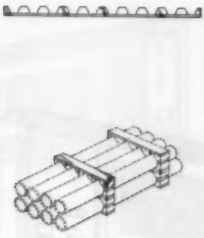


273,758
HOLDER FOR AN ABRASIVE SURFACE
Frank F. Ali, 2973 Pascal Dr., Fairborn, Ohio 45324
Filed Apr. 20, 1981, Ser. No. 255,702
Term of patent 14 years
U.S. Cl. D8—71

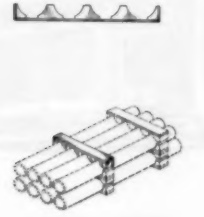


273,759
NAIL DRIVER
Michael Drori, Kibbutz Hagroshrim, Mobile Post, Upper Galilee, Israel
Filed Feb. 10, 1982, Ser. No. 347,548
Claims priority, application Israel, Oct. 12, 1981, 8765
Term of patent 14 years
U.S. Cl. D8—75

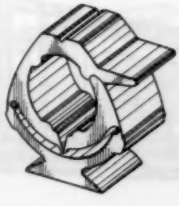
273,760
PIPE SUPPORTING AND SPACING MEMBER
Isao Takei, Yokohama, Japan, assignor to Nichiei Distribution Systems Inc., Kawasaki and Nippon Kokan Kabushiki Kaisha, Tokyo, both of, Japan
Filed Jun. 24, 1981, Ser. No. 276,911
Claims priority, application Japan, Dec. 25, 1980, 55-054269
Term of patent 14 years
U.S. Cl. D8—354



273,761
PIPE SUPPORTING AND SPACING MEMBER
Isao Takei, Yokohama, Japan, assignor to Nichiei Distribution Systems, Inc., Kawasaki and Nippon Kokan Kabushiki Kaisha, Tokyo, both of, Japan
Filed Jun. 24, 1981, Ser. No. 276,914
Claims priority, application Japan, Dec. 25, 1980, 55-054267
Term of patent 14 years
U.S. Cl. D8—354



273,762
SNAP-ACTION CLIP
Keizaburo Sakaguchi, Tokyo, Japan, assignor to Sakaguchi Plastic Industrial Co., Ltd., Tokyo, Japan
Filed Jun. 25, 1981, Ser. No. 276,886
Claims priority, application Japan, Dec. 25, 1980, 55-54275
Term of patent 14 years
U.S. Cl. D8—396



273,763

SNAP-ACTION CLIP

Keizaburo Sakaguchi, Tokyo, Japan, assignor to Sakaguchi Plastic Industrial Co., Ltd., Tokyo, Japan

Filed Jun. 25, 1981, Ser. No. 276,907

Claims priority, application Japan, Dec. 25, 1980, 55-54276

Term of patent 14 years

U.S. Cl. D8—396

273,764

COMBINED BOTTLE AND CONTAINER

Franz Steigerwald, Griesheim; Karlheinz Zulauf, Höchst-Hasenroth, and Armin Höllwarth, Darmstadt, all of Fed. Rep. of Germany, assignors to Wella AG, Darmstadt, Fed. Rep. of Germany

Filed Dec. 10, 1981, Ser. No. 329,616

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 8 MR 842

Term of patent 14 years

U.S. Cl. D9—369

273,765

CONTAINER FOR CREAM-LIKE EDIBLE PRODUCTS

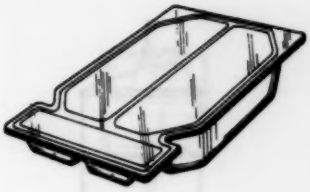
Lorenzo Cillario, Alba, Italy, assignor to Ferrero S.p.A., Alba, Italy

Filed Dec. 15, 1981, Ser. No. 330,871

Claims priority, application Italy, Jun. 16, 1981, 53365/81[U]

Term of patent 14 years

U.S. Cl. D9—341



273,766

PACKAGING CONTAINER

Deirdre A. Lampe, Sydney, Australia, assignor to Pavlova Pantry Pty. Ltd., Sydney, Australia

Filed Jul. 16, 1981, Ser. No. 284,013

Claims priority, application Australia, Mar. 31, 1981, 83,778

Term of patent 14 years

U.S. Cl. D9—352

273,767

BOTTLE OR THE LIKE

Gerhard H. Weiler, South Barrington, Ill., assignor to Automatic Liquid Packaging, Inc., Arlington Heights, Ill.

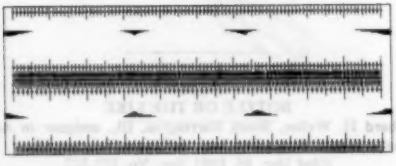
Filed Dec. 16, 1981, Ser. No. 331,322

Term of patent 14 years

U.S. Cl. D9—352

273,768
BOTTLE
Jason K. Sedam, Dunwoody, and Simon J. Richter, Marietta, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed Oct. 9, 1981, Ser. No. 310,367
Term of patent 14 years
U.S. Cl. D9—375

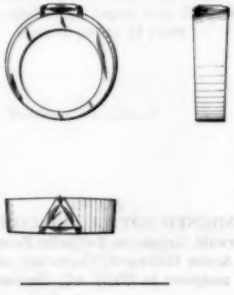
273,769
RULER
Fahim R. Sidrak, 4649 Norwich Rd., Wilmington, N.C. 28405
Filed Jan. 7, 1982, Ser. No. 337,606
Term of patent 14 years
U.S. Cl. D10—71



273,770
Patent Not Issued For This Number

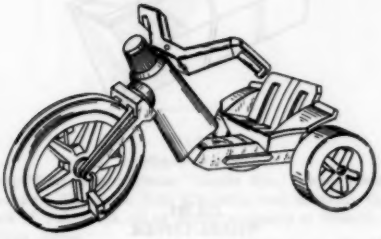
273,771
RING
Marina Bulgari, Athens, Greece, assignor to Marina B Creation S.A., Vaduz, Liechtenstein
Filed Oct. 9, 1981, Ser. No. 310,428
Claims priority, application Italy, Apr. 13, 1981, 35739/81[U]
Term of patent 14 years
U.S. Cl. D11—34

273,772
RING
Marina Bulgari, Athens, Greece, assignor to Marina B Creation S.A., Vaduz, Liechtenstein
Filed Dec. 30, 1981, Ser. No. 335,750
Claims priority, application Italy, Jul. 2, 1981, 35894/81[U]
Term of patent 14 years
U.S. Cl. D11—35



273,773
AUTOMOBILE
Claus Luthe, Munich; Manfred Rennen, Ingolstadt, and Hans Braun, Lohhof, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Mar. 26, 1981, Ser. No. 247,909
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1980, MR 12 272
Term of patent 14 years
U.S. Cl. D12—92

273,774
CHILD'S RIDING VEHICLE
Richard C. Levy; Sheryl Levy, both of 6737 Newbold Dr., Bethesda, Md. 20817, and Gary Piaget, 5 Ridley Ct., Glenn Ridge, N.J. 07028
Filed Nov. 9, 1981, Ser. No. 319,278
Term of patent 14 years
U.S. Cl. D12—112

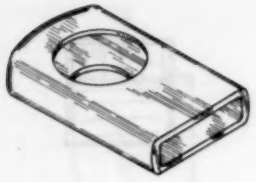


273,775
BICYCLE CONSOLE
Kevin R. Aker, Fairfield, and Jeffery G. Martin, Kettering, both of Ohio, assignors to Huffy Corporation, Miamisburg, Ohio
Filed Oct. 7, 1981, Ser. No. 309,315
Term of patent 14 years
U.S. Cl. D12—114

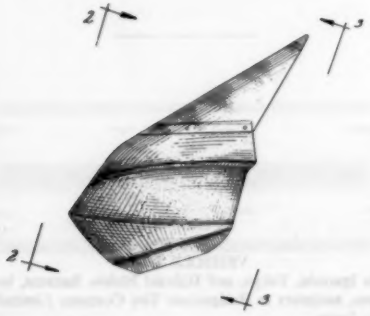
273,776
MOVABLE VEHICLE FOR THE HANDICAPPED
Eugene F. Forrest, 423 James Ter., Sault Ste Marie, Mich. 49783
Filed Feb. 4, 1982, Ser. No. 345,933
Term of patent 14 years
U.S. Cl. D12—128

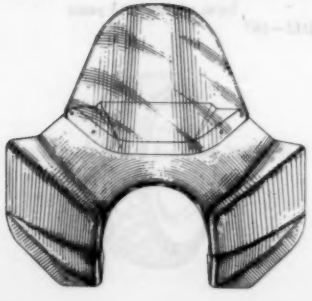
273,777
VEHICLE TIRE
Toshio Igarashi, Tokyo, and Hideaki Nishio, Saitama, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Nov. 25, 1981, Ser. No. 324,889
Claims priority, application Japan, May 29, 1981, 56-22938
Term of patent 14 years
U.S. Cl. D12—147

273,778
GUARD FOR A VEHICLE HITCH
Blue Ruhland, R.R. No. 1, Kingsley, Iowa 51028
Filed Nov. 12, 1981, Ser. No. 320,189
Term of patent 14 years
U.S. Cl. D12—162

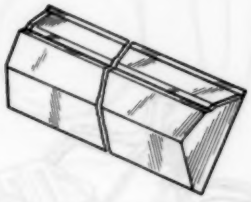


273,779
MOTORCYCLE FAIRING
Duane L. Anderson; Lewis R. Morris; Kenneth W. Cummings, and Robert S. Clarke, all of Rantoul, Ill., assignors to First Champaign Corporation, Rantoul, Ill.
Filed Jan. 15, 1982, Ser. No. 339,615
Term of patent 14 years
U.S. Cl. D12—182



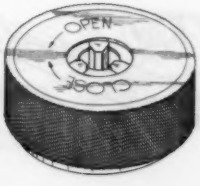


273,780
RUB RAIL FOR AUTOMOBILE
Claus Luthe, Munich; Manfred Rennen, Igolstadt, and Hans Braun, Lohhof, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Wereke A.G., Munich, Fed. Rep. of Germany
Filed Mar. 27, 1981, Ser. No. 248,365
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1980, MR 12 271
Term of patent 14 years
U.S. Cl. D12—190

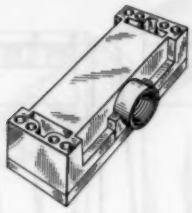


273,781
WHEEL COVER
Leif H. Chapman, Sylvan Lake, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Oct. 23, 1981, Ser. No. 314,250
Term of patent 14 years
U.S. Cl. D12—211

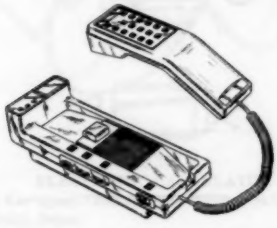
273,782
UNIVERSAL CABLE CONNECTOR FOR FIBER OPTIC CABLES AND THE LIKE
Richard E. Feinbloom, New York; Richard Lepczynski, Brooklyn, and Waldyslaw Oleksy, New York, all of N.Y., assignors to Designs for Vision, Inc., New York, N.Y.
Filed Jun. 1, 1981, Ser. No. 268,717
Term of patent 14 years
U.S. Cl. D13—24



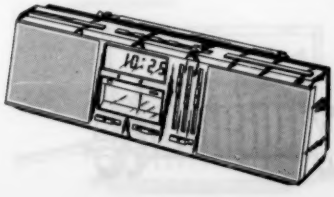
273,783
EXPLOSION-PROOF HOUSING FOR ELECTRICAL CIRCUIT COMPONENTS
Thomas J. Holce, Portland, and Charles M. Huckins, Tigard, both of Oreg., assignors to Sentrol, Inc., Portland, Oreg.
Filed Apr. 20, 1981, Ser. No. 255,567
Term of patent 14 years
U.S. Cl. D13—40



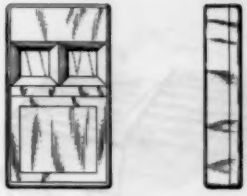
273,784
TELEPHONE
Masato Shibayama, Sayama; Takeshi Abe, Tokyo; Yoshifumi Asakawa, Yokosuka; Seiji Kinoshita, and Kazuhisa Ogawa, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 28, 1982, Ser. No. 343,596
Claims priority, application Japan, Aug. 21, 1981, 56-36482
Term of patent 14 years
U.S. Cl. D14—53



273,785
CLOCK RADIO RECEIVER
Grant M. N. Davidson, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jan. 18, 1982, Ser. No. 340,167
Claims priority, application United Kingdom, Jul. 22, 1981, 1.001.605
Term of patent 14 years
U.S. Cl. D14—73



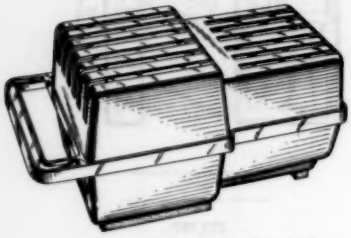
273,786
ENCLOSURE FOR A PORTABLE HANDHELD TRANSMITTER
Owerko, Raton, N. Mex., assignor to A.R.F. Products, Inc., Raton, N. Mex.
Filed Sep. 15, 1981, Ser. No. 302,570
Term of patent 14 years
U.S. Cl. D14—95



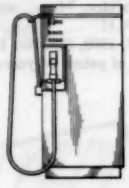
273,787
CALCULATOR TELEPHONE
Paul C. Matthews, III, 57 Front St., Brooklyn, N.Y. 11201
Filed Nov. 5, 1981, Ser. No. 318,640
Term of patent 14 years
U.S. Cl. D14—101

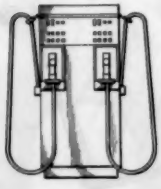
273,788
CASE FOR A KEYBOARD AND DISPLAY UNIT
Charles M. Ault, Winchester, Mass., assignor to Termiflex Corporation, Nashua, N.H.
Filed Sep. 5, 1980, Ser. No. 184,227
Term of patent 14 years
U.S. Cl. D14—114

273,789
PORTABLE AIR COMPRESSOR
William J. Davis, Levittown, Pa., assignor to Interdynamics, Inc., Brooklyn, N.Y.
Filed Sep. 2, 1982, Ser. No. 414,492
Term of patent 14 years
U.S. Cl. D15—9

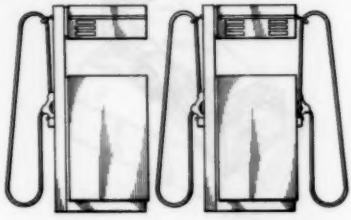


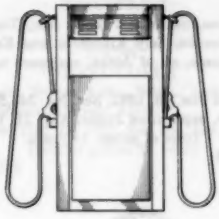
273,790
FUEL DISPENSER
Glenn W. Monigle, Golden, and David W. Roecker, Denver, both of Colo., assignors to Dresser Industries, Inc., Dallas, Tex.
Division of Ser. No. 118,376, Feb. 4, 1980, Pat. No. 266,673.
This application Apr. 5, 1982, Ser. No. 365,839
Term of patent 14 years
U.S. Cl. D15—9.1



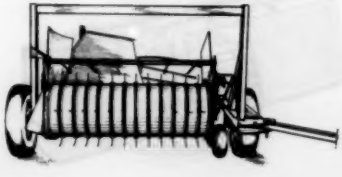


273,791
FUEL DISPENSER
Glenn W. Monigle, Golden, and David W. Roecker, Denver, both of Colo., assignors to Dresser Industries, Inc., Dallas, Tex.
Division of Ser. No. 118,376, Feb. 4, 1980, Pat. No. 266,673.
This application Apr. 5, 1982, Ser. No. 365,840
Term of patent 14 years
U.S. Cl. D15—9.1





273,792
MACHINE FOR INVERTING A HAY WINDROW
Herman R. Ender, Sr., 29516 Bird Rd., Tracy, Calif. 95376
Filed Feb. 5, 1983, Ser. No. 346,802
Term of patent 14 years
U.S. Cl. D15—27

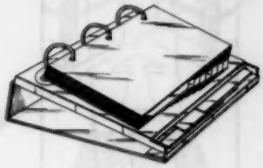


273,793
AUTO TRANSMISSION REFILL TUBE SOCKET
Ferrell D. Nachatelo, 14555 Escalon Bellota Rd., Escalon, Calif. 95320
Filed Oct. 5, 1981, Ser. No. 308,925
Term of patent 14 years
U.S. Cl. D15—150

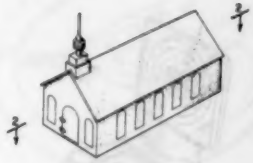
273,794
SUNGLASSES
Aaron M. Markovitz, Rochester, and Robert H. Ramp, Pittsford, both of N.Y., assignors to Bausch & Lomb, Inc., Rochester, N.Y.
Filed Feb. 8, 1982, Ser. No. 346,967
Term of patent 14 years
U.S. Cl. D16—112

273,795
ELECTRONIC CALCULATOR
Masafumi Yamagami, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jun. 16, 1981, Ser. No. 274,234
Claims priority, application Japan, Dec. 19, 1980, 55-53641
Term of patent 14 years
U.S. Cl. D18—7

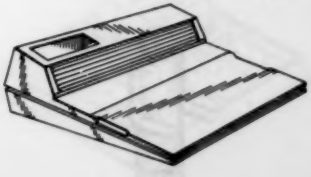
273,796
COMBINED BINDER AND EASEL FOR STORAGE AND USE OF COMPUTER SOFTWARE AND INSTRUCTIONAL MATERIAL
Charles G. Milden, 7404 Saddlehill Trail, Orange, Calif. 92669
Filed Jan. 4, 1982, Ser. No. 337,414
Term of patent 14 years
U.S. Cl. D19—27



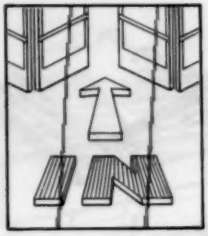
273,797
MODEL CHURCH FOR TEACHING RELIGIOUS PROCEDURES OR THE LIKE
Olivia Richardson, 111 N. Swain St., Raleigh, N.C. 27601
Filed Aug. 31, 1981, Ser. No. 297,834
Term of patent 14 years
U.S. Cl. D19—62



273,798
HOLDER FOR MULTIPLE PADS OF NOTEPAPER
Walter C. Pearson, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Aug. 3, 1981, Ser. No. 289,774
The portion of the term of this patent subsequent to Sep. 27, 1997, has been disclaimed.
Term of patent 14 years
U.S. Cl. D19—91



273,799
IN-OUT SYMBOL FOR AUTOMATIC OPENING HINGED GLASS DOORS
Jack Darrell, 1646 Old Spanish Trail, Houston, Tex. 77054
Filed Mar. 1, 1982, Ser. No. 353,532
Term of patent 14 years
U.S. Cl. D20—11

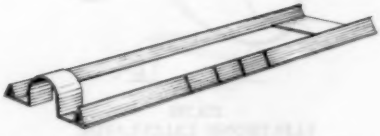


273,800
AIR TRAFFIC CONTROLLER GAME HOUSING
Mel Appel, Nine Nottingham Rd., Livingston, N.J. 07039, and George Kress, Scotch Plains, N.J., assignors to Mel Appel, Livingston, N.J.
Filed Dec. 3, 1981, Ser. No. 327,124
Term of patent 14 years
U.S. Cl. D21—13

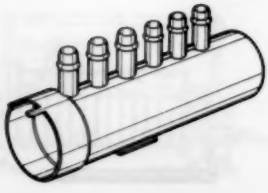
273,801
FIGURINE OR STATUETTE OF GAME PLAYING PIECES OR THE LIKE
Shawn D. Olfman, 17-165 Kennedy St., Winnipeg, Manitoba, Canada (R3C 1S6), and Jerry A. Olfman, 70 Polson Ave., Winnipeg, Manitoba, Canada (R2W 0M2)
Filed Jul. 16, 1981, Ser. No. 283,964
Term of patent 14 years
U.S. Cl. D21—51

273,802
SOUND EMITTING PROBE FOR TOY OR SIMILAR ARTICLE
William J. Bousman, Burlington, Wis., assignor to Western Publishing Company, Racine, Wis.
Filed Jun. 8, 1981, Ser. No. 271,489
Term of patent 14 years
U.S. Cl. D21—64

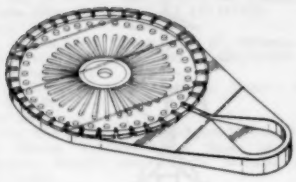
273,803
PUTTING AID FOR GOLFERS
Graham J. Johnson, 58 Jacaranda St., East Ipswich, Australia (4305)
Filed May 28, 1982, Ser. No. 382,814
Claims priority, application Australia, May 5, 1982, 0293/82
Term of patent 14 years
U.S. Cl. D21—234



273,804
MODULAR LIQUID OR GAS MANIFOLD FOR A SWIMMING POOL SOLAR HEATER
Karl Fueloep, 27 Braund Rd., Fitzroy, State of South Australia, Australia
Filed Jun. 25, 1981, Ser. No. 277,971
Claims priority, application Australia, Nov. 27, 1980, 82714; Jan. 16, 1981, 83158
Term of patent 14 years
U.S. Cl. D23—127

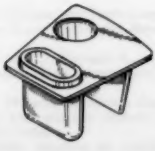


273,805
DENTAL PIN DISPENSER PACKAGE
Stuart J. Filhol, Castlefreke, County Cork, Ireland
Filed Jun. 5, 1981, Ser. No. 270,615
Claims priority, application United Kingdom, Dec. 6, 1980, 997935
Term of patent 14 years
U.S. Cl. D24—10

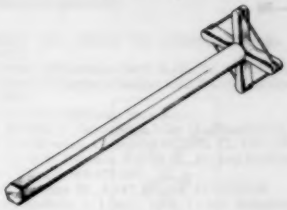


273,806
REAMER/RASP TOOL, WITH DISPOSABLE, DEBRIS RETAINING CUTTING SURFACE
Richard C. Bolesky; Nicholas Cindrich, both of Warsaw, and Michael H. Doll, North Webster, all of Ind., assignors to Zimmer, Inc., Warsaw, Ind.
Filed Aug. 3, 1981, Ser. No. 289,546
Term of patent 14 years
U.S. Cl. D24—28

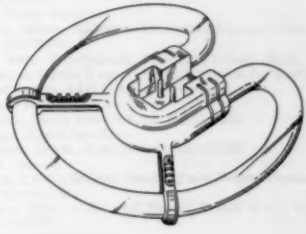
273,807
SAMPLE CUP OR THE LIKE
James T. Holen, Mundelein, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Jun. 4, 1981, Ser. No. 270,310
Term of patent 14 years
U.S. Cl. D24—56



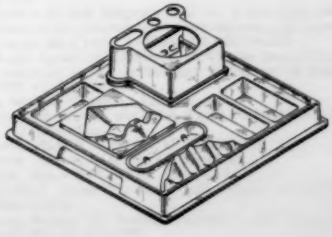
273,808
DENTAL FLOSSER
Eric L. Smith, 638 Potomac Ave., Hagerstown, Md. 21740
Filed Dec. 2, 1981, Ser. No. 326,514
Term of patent 14 years
U.S. Cl. D28—64



273,809
FLUORESCENT LAMP
John M. Chapman, Kent, and Basil Antonis, London, both of England, assignors to Thorn EMI Limited, London, England
Filed Aug. 4, 1981, Ser. No. 290,008
Claims priority, application United Kingdom, Mar. 31, 1981, 999726
Term of patent 14 years
U.S. Cl. D26—3



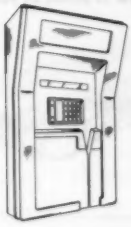
273,810
NAIL TREATMENT TRAY
Benson Zinbarg, Stamford, Conn., assignor to Sun Hill Industries, Inc., Stamford, Conn.
Filed Apr. 7, 1982, Ser. No. 366,202
Term of patent 14 years
U.S. Cl. D28—61



273,811
PLASTIC SHEET MATERIAL FOR SURFACING A WALL PANEL OR SIMILAR ARTICLE
Joseph Potz, 19727 Mt. Pisgah Rd., Silver Spring, Md. 20903
Division of Ser. No. 106,945, Feb. 5, 1980, Pat. No. 263,513.
This application Aug. 19, 1981, Ser. No. 294,280
Term of patent 14 years
U.S. Cl. D92—30

273,812
DEVICE FOR USE IN PARAPSYCHOLOGY
Vincent Stillace, 53, rue Olivier-Metra, 75020 Paris, France
Filed Feb. 11, 1981, Ser. No. 233,444
Claims priority, application France, Aug. 12, 1980, 802621
Term of patent 14 years
U.S. Cl. D99—25

273,813
CREDIT CARD TERMINAL
Robert Case, Chicago, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.
Filed Dec. 3, 1981, Ser. No. 327,139
Term of patent 14 years
U.S. Cl. D99—28



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF MAY, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Inc.: *See*—
Taylor, Chandler R., Jr., 4,447,361, Cl. 260-244.400.

Aasen, Steven M.: *See*—
Tiers, George V. D.; Aasen, Steven M.; Dalzell, Rex J.; and Holmes, Brian N., 4,447,521, Cl. 430-337.000.

AB Ferrosan: *See*—
Bjork, Anders K. K.; Olsson, Knut G.; Abramo, Aina L.; and Christensson, Erik G., 4,447,433, Cl. 424-250.000.

Ababurko, Victor: *See*—
Stevens, Colin R.; and Ababurko, Victor, 4,446,791, Cl. 101-122.000.

Abe, Hisao: *See*—
Masujima, Sho; Shibuya, Masahide; Shoichi, Iwaya; Umeda, Kenichi; Oikawa, Yasunobu; Abe, Hisao; Midori, Yoshifumi; Fujiwara, Shinobu; and Kikuchi, Nobuaki, 4,447,549, Cl. 501-138.000.

Abendroth, Paul; and Despot, Janko, to M.A.N. - Roland. Device for applying a fluid, in particular lacquers on printed sheets or continuous webs. 4,446,814, Cl. 118-694.000.

Abex Corporation: *See*—
Novotny, Raymond J.; and Mulder, James P., 4,446,638, Cl. 37-142.00A.

Abramo, Aina L.: *See*—
Bjork, Anders K. K.; Olsson, Knut G.; Abramo, Aina L.; and Christensson, Erik G., 4,447,433, Cl. 424-250.000.

Academy of Applied Science, Inc., The: *See*—
Rines, Robert H., 4,447,896, Cl. 367-96.000.

Ace Fishing & Rental Tools, Inc.: *See*—
Cooper, Larry V.; and Sloane, Michael W., Sr., 4,446,610, Cl. 29-421.00E.

ACF Industries, Incorporated: *See*—
Behle, Gunter R., 4,447,039, Cl. 251-144.000.

Ackerman, Allen D.; and Aula, Howard A., to Ford Motor Company. Method of making a cast aluminum based engine block. 4,446,906, Cl. 164-112.000.

Acme Steel Door Corp.: *See*—
Siegal, Burton L., 4,446,669, Cl. 52-738.000.

Acra-Plant, Inc.: *See*—
Robertson, Forrest E., 4,446,927, Cl. 172-753.000.

Adam, Clyde E.: *See*—
Price, William L.; Murtha, John C.; Ross, James A., Jr.; Adam, Clyde E.; and Lucas, Kenneth R., 4,447,873, Cl. 364-200.000.

Adams, George A.: *See*—
Rock, Gail A.; and Adams, George A., 4,447,415, Cl. 424-101.000.

Adams, Richard G.: *See*—
Taylor, Andrew W.; and Adams, Richard G., 4,447,422, Cl. 424-229.000.

Adamson, David L.: *See*—
Davis, Larry A.; Boyce, Gregory H.; Mulloy, Timothy P.; Nebeker, Neil J.; Newman, Elmer C.; Quinn, Donald J.; and Adamson, David L., 4,447,307, Cl. 204-267.000.

Adcock, Thomas P. Solar collector panel. 4,446,853, Cl. 126-450.000.

Adkins, Richard C., to Rolls-Royce Limited. Fluidic control of airflow in combustion chambers. 4,446,692, Cl. 60-39.230.

Adl, Mohammad S.; Kegeler, Gary H.; and Vandersall, Howard L., to Monsanto Company. Stabilized galactomannan gum compositions. 4,447,337, Cl. 252-7.000.

Adolf, Lutz-Erdmut; and Oberwelland, Klaus, to August Stork KG. Device for the preparation of hollow confectionery parts. 4,447,202, Cl. 425-434.000.

Adsett, David E., to Allied Corporation. Method and apparatus for encoding graphics. 4,447,831, Cl. 358-283.000.

Advanced Energy Concepts '81, Ltd.: *See*—
Shaffer, James E.; and Distin, Robert G., Jr., 4,446,752, Cl. 74-462.000.

AEL Microtel, Ltd.: *See*—
Sewerinson, Ake N., 4,447,903, Cl. 371-68.000.

Aeschlimann, Peter, to Ciba-Geigy Corporation. Substituted 2-(chloro, bromo or cyano)-4,6-dinitrophenyl azo phenyl dyes. 4,447,359, Cl. 260-207.000.

Agency of Industrial Science and Technology: *See*—
Ebata, Yoshihiro; Kose, Saburo; and Hayami, Ryozo, 4,447,283, Cl. 156-325.000.

Ahn, Byung K.; and Morris, Kenneth A., to Koppers Company, Inc. Removal of bromides from arsenic acid solution. 4,447,405, Cl. 423-88.000.

Ahrens, Paul W., to Miracle Recreation Equipment Company. Playground equipment with wooden timbers having internal fasteners. 4,447,055, Cl. 272-113.000.

Ai, Hideo; and Tsuruta, Naohiro, to Asahi Kasei Kogyo Kabushiki Kaisha. Resin composition, coating material comprising said resin composition and method for forming coatings. 4,447,580, Cl. 525-121.000.

Aigo, Seiichiro. Information card. 4,447,716, Cl. 235-492.000.

Aikman, Leslie N. Cigarette holder with filtering action. 4,446,877, Cl. 131-198.00R.

Air Products and Chemicals, Inc.: *See*—
Cook, Gerald R.; Iacoviello, John G.; Pinschmidt, Robert K., Jr.; and Davidowich, George, 4,447,570, Cl. 524-127.000.
Ross, David S.; Johnson, Robert M., Jr.; and Malhotra, Ripudaman, 4,447,662, Cl. 568-939.000.
Schuck, Thomas W., 4,447,195, Cl. 417-570.000.
Woytek, Andrew J.; Lileck, John T.; and Steigerwalt, Edward J., 4,446,920, Cl. 166-297.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Fujii, Takashi, 4,446,699, Cl. 60-547.100.
Iwasaki, Shinichiro, 4,446,842, Cl. 123-606.000.
Katagiri, Masayoshi; Kondo, Toshio; and Midooka, Masanori, 4,447,066, Cl. 277-212.0FB.
Masai, Hiroto, 4,446,952, Cl. 192-58.00B.
Sakakibara, Naoji; Amano, Hiroyuki; and Morioka, Hiroaki, 4,446,889, Cl. 137-625.400.
Sakakibara, Naoji, 4,446,940, Cl. 180-177.000.
Suzuki, Koichi; Yoshihara, Mikio; Kawai, Shinji; and Mori, Katsuhiro, 4,446,584, Cl. 4-237.000.

AKG Akustische u.Kino-gerate Gesellschaft mbH: *See*—
Fidi, Werner, 4,447,678, Cl. 179-115.5PS.

Akiyama, Nobuyuki: *See*—
Kuni, Asahiro; Kembo, Yukio; Akiyama, Nobuyuki; and Aoki, Nobuhiko, 4,447,731, Cl. 250-442.100.

Akiyama, Takehiro: *See*—
Suzuki, Hirokazu; and Akiyama, Takehiro, 4,447,704, Cl. 219-216.000.

Akiyama, Teruo: *See*—
Harada, Hikaru; Akiyama, Teruo; and Hiyama, Tuneo, 4,447,543, Cl. 436-72.000.

Akiyama, Toru; Kamihigoshi, Tsutomu; Takagi, Shoji; and Maeda, Tadayuki, to Daikin Kogyo Co., Ltd. Process for continuous fluorination of carbon. 4,447,663, Cl. 570-150.000.

Aktiebolaget Bofors: *See*—
Simmons, Bjorn, 4,446,794, Cl. 102-513.000.

Aktiebolaget Electrolux: *See*—
Krouthen, Jan K., 4,447,394, Cl. 422-27.000.

Akzo N.V.: *See*—
Carlyle, Ian C.; Savage, David S.; and Sleigh, Thomas, 4,447,425, Cl. 424-241.000.
Geerdes, Dirk J. F.; and Nelen, Petrus J. C., 4,447,567, Cl. 523-501.000.

Akzona Incorporated: *See*—
Linhart, Heinz; Modtler, Reiner; and Kratzsch, Eberhard, 4,447,489, Cl. 428-225.000.

Albers, Rolf: *See*—
Kotzur, Joachim; Reinersmann, Hans H.; Albers, Rolf; Aschenbruck, Emil; and Neuhaus, Gunter, 4,447,063, Cl. 277-80.000.

Alexandrescu, Mircea; and Haendle, Joerg, to Siemens Aktiengesellschaft. X-Ray diagnostic installation. 4,447,827, Cl. 358-111.000.

Alford Industries, Inc.: *See*—
Gray, Sharon L., 4,447,003, Cl. 229-44.0CB.

Allen, Harold T., to Ransburg Corporation. Atomizing device motor. 4,447,003, Cl. 239-214.130.

Allen, John H., to United States of America, Navy. Serial to parallel data conversion interface circuit. 4,447,804, Cl. 340-347.0DD.

Allen, Melvin K.; Berri, Ronald J.; and Winther, Douglas N., to Banner/Technical Devices Company, Inc. Adjustably dimensioned uniformly distributed solder wave apparatus. 4,447,001, Cl. 228-37.000.

Allen, Robert H.; and Seligman, Paul A., to University Patents, Inc. Immunoassay for measurement of reticulocytes, and immunoreactive reagents for use therein. 4,447,547, Cl. 436-543.000.

Allen, Roger A.; and Hall, Robert J., to Wiggins Teape Group Limited, The. Assembly for use in the spark perforation of sheet material. 4,447,708, Cl. 219-384.000.

Alliance Machine Company, The: *See*—
Kinkopf, Edward J.; and Polen, Karl L., 4,446,813, Cl. 118-72.000.

Allied Corporation: *See*—
Adsett, David E., 4,447,831, Cl. 358-283.000.
Gilman, John J., 4,446,666, Cl. 52-648.000.
Jensen, Henry E., 4,447,508, Cl. 429-57.000.
Oxenrider, Bryce C.; and Long, David J., 4,447,629, Cl. 556-419.000.
Stover, Richard W.; Proper, Frederick T.; and Young, Steven A., 4,447,061, Cl. 277-1.000.

Allis-Chalmers Corporation: *See—*
Renner, Elmer J., 4,446,963, Cl. 198-735.000.

Allison, Johnny H. Wind power electrical generator system. 4,447,738, Cl. 290-44.000.

Allori, Aldo: *See—*
Voss, Julian D.; Allori, Aldo; and Wilger, John A., 4,446,953, Cl. 192-70.120.

Alpha Corporation of Tennessee: *See—*
Bayha, Charles E., 4,447,577, Cl. 524-845.000.

Alt, Joyce M.: *See—*
Gula, John A.; Brady, John D.; Thompson, Thomas C.; and Alt, Joyce M., 4,447,230, Cl. 604-122.000.

Altman, Robert G.: *See—*
Englar, Donald G.; and Altman, Robert G., 4,447,395, Cl. 422-68.000.

Alumin-Art Plating Company: *See—*
Rudy, Sol, 4,447,049, Cl. 269-46.000.

Amada, Takayoshi: *See—*
Watanabe, Masaru; Matsumura, Satoru; Amada, Takayoshi; Irie, Hiromitsu; and Saito, Norihisa, 4,447,293, Cl. 159-6.200.

Amagami, Keizo: *See—*
Mizukawa, Takuni; Amagami, Keizo; and Kobayashi, Takao, 4,447,691, Cl. 219-10.49R.

Amano, Hiroyuki: *See—*
Sakakibara, Naoji; Amano, Hiroyuki; and Morioka, Hiroaki, 4,446,889, Cl. 137-625.400.

American Can Company: *See—*
Gold, Vance B.; Kubacki, Edward F.; and Krewenka, Thomas, 4,447,699, Cl. 219-110.000.

American Cyanamid Company: *See—*
Dusza, John P.; Joseph, Joseph P.; and Berstein, Seymour, 4,447,442, Cl. 424-273.00P.
Klothen, Irving, 4,447,421, Cl. 424-227.000.
Paul, Rolf, 4,447,603, Cl. 544-184.000.

American Hoist & Derrick Company: *See—*
Johnson, Charles A.; and Lucker, Laurence H., Jr., 4,446,807, Cl. 114-230.000.

American Home Products Corporation: *See—*
Klaubert, Dieter H.; and Bell, Stanley C., 4,447,611, Cl. 546-118.000.

American National Red Cross: *See—*
Menache-Aronson, Doris; Kosow, David P.; Orthner, Carolyn L.; and Behre, H. Evan, 4,447,416, Cl. 424-101.000.

American Seating Company: *See—*
Quigley, Robert E., 4,446,659, Cl. 52-9.000.

American Standard, Inc.: *See—*
Nolden, Werner, 4,446,885, Cl. 137-360.000.

AMP Incorporated: *See—*
Cooper, Ronald F.; and Johnson, Erlon F., 4,447,121, Cl. 350-96.200.
Desmarais, Mark R., 4,447,681, Cl. 200-5.00A.
Kourimsky, Friedrich J. A.; and Lothmann, Werner, 4,447,102, Cl. 339-91.00R.

Anand, Nitya: *See—*
Salman, Mohammad; Ray, Suprabhat; Kamboj, Ved P.; and Anand, Nitya, 4,447,622, Cl. 548-525.000.

Andersen, Mark S., to Combustion Engineering, Inc. Fluidized bed fuel feed system. 4,446,799, Cl. 110-263.000.

Anderson, Carl. Brace for securing a pole to support surface. 4,446,945, Cl. 182-229.000.

Anderson, Dennis C., to National Polymers, Inc. Unitary flower pot. 4,446,652, Cl. 47-66.000.

Anderson, Lloyd E.: *See—*
Bell, Dwain C.; Anderson, Lloyd E.; and Anderson, Martin L., 4,446,593, Cl. 15-322.000.

Anderson, Martin L.: *See—*
Bell, Dwain C.; Anderson, Lloyd E.; and Anderson, Martin L., 4,446,593, Cl. 15-322.000.

Andersson, Bengt: *See—*
Sandered, Bror; Carlsson, Rune; and Andersson, Bengt, 4,447,013, Cl. 242-54.00R.

Andreasen, Norman H. Kiln floor system. 4,446,751, Cl. 74-422.000.

Andrews, David A.: *See—*
Davies, Graham J.; Heckingbottom, Roger; and Andrews, David A., 4,447,276, Cl. 148-175.000.

Andrews, Frank D.: *See—*
Schoolman, William K.; Griman, George A.; and Andrews, Frank D., 4,446,654, Cl. 49-181.000.

Andrews, Richard J.: *See—*
Mowbray, Dorian F.; Fenne, Ivor; and Andrews, Richard J., 4,446,836, Cl. 123-450.000.

Angevine, Philip J.; Audeh, Costandi A.; Tabak, Samuel A.; and Yan, Tsoung Y., to Mobil Oil Corporation. Process for improving the diesel fuel quality of coal derived liquids. 4,447,312, Cl. 208-46.000.

Anouchi, Abraham Y.; Novack, Robert L.; and Tomasovic, Beth, to Bacharach Instrument Company. Catalytic gas sensor. 4,447,397, Cl. 422-94.000.

Anphar S.A.: *See—*
Spickett, Robert G. W.; Mauri, Jacinto M.; and Puchades, Jesus E. B., 4,447,417, Cl. 424-156.000.

Antenore, Donald E.; Schmadeke, Donald W.; and Stewart, Rodney A., to Land O'Lakes, Inc. Process for producing a butter/margarine blend product. 4,447,463, Cl. 426-603.000.

Anthony, Myron L.; and Anthony, Shane D. L. Projectile firing weapon with wad discharge port. 4,446,771, Cl. 89-14.0SB.

Anthony, Shane D. L.: *See—*
Anthony, Myron L.; and Anthony, Shane D. L., 4,446,771, Cl. 89-14.0SB.

Anzeveno, Peter B.: *See—*
White, William L.; and Anzeveno, Peter B., 4,447,636, Cl. 560-122.000.

Aoki, Nobuhiko: *See—*
Kuni, Asahiro; Kembo, Yukio; Akiyama, Nobuyuki; and Aoki, Nobuhiko, 4,447,731, Cl. 250-442.100.

Aoshima, Shozo; Hirose, Noboru; and Ishikawa, Michio, to Brother Kogyo Kabushiki Kaisha. Torque detecting apparatus. 4,446,746, Cl. 73-862.330.

Apparatebau Rothemuhle Brandt & Kritzler GmbH: *See—*
Reidick, H.; Leithner, R.; Kirchhoff, F. J.; Puritz, E.; and Schluter, S., 4,446,911, Cl. 165-4.000.

Appell, Marc: *See—*
Bradley, John J.; Franklin, Benjamin S.; Slosberg, David M.; Appell, Marc; Cassonnet, Jean-Claude; and De Sabatier, Philippe D., 4,447,874, Cl. 364-200.000.

Applied Power Inc.: *See—*
Oudelaar, Tone, 4,446,939, Cl. 180-89.150.

Arai, Shoji: *See—*
Yoneda, Kenji; Arai, Shoji; and Kunome, Yoshimi, 4,446,834, Cl. 123-440.000.

Arai, Yasunori, to Asahi Kogaku Kogyo Kabushiki Kaisha. Large-aperture telephoto lens. 4,447,137, Cl. 350-454.000.

Archer, David H.: *See—*
Young, William E.; Lunn, Richard H.; and Archer, David H., 4,447,748, Cl. 310-11.000.

Archibald, John L.; and Boyle, John T. A., to John Wyeth & Brother Limited. Thiazolotriazine derivatives. 4,447,604, Cl. 544-219.000.

Argus Chemical Corporation: *See—*
Brecker, Lawrence R.; Keeley, Charles; and Brilliant, Stuart D., 4,447,569, Cl. 524-109.000.
Loeffler, Otto E.; Jain, Nirnal S.; and Kauder, Otto S., 4,447,335, Cl. 252-1.000.

Arimura, Takashi: *See—*
Matsumura, Toshimi; Fujisawa, Hideya; Omori, Norio; Arimura, Takashi; Yamazoe, Hisamitsu; and Nishiura, Kiyotaka, 4,446,832, Cl. 123-339.000.

Aritake, Toshiyuki, to Mitsubishi Plastics Industries Limited. Adhesive tape and process for its production. 4,447,485, Cl. 428-144.000.

Arizona Chemical Company: *See—*
Scharrer, Roland P. F.; Schluenz, Robert W.; and Kramss, Richard H., 4,447,354, Cl. 260-106.000.

Arlauskas, Alfonsas, to General Motors Corporation. Door hinge and hold open. 4,446,596, Cl. 16-333.000.

Armstrong World Industries, Inc.: *See—*
Goldfarb, Louis; and Sweigart, Clyde M., 4,447,347, Cl. 252-70.000.
Piersol, Jay L., 4,447,560, Cl. 521-68.000.

Arndt, Manfred; Breier, Walter; Riegert, Hermann; Schmidt, Heinz; Schwarz, Hermann; and Warneke, Helmut, to Wurttemberische Metallwarenfabrik Aktiengesellschaft. Insulated container. 4,446,978, Cl. 215-13.00R.

Arntsen, Tom D.; and Toumani, Rouben, to Bell Telephone Laboratories, Incorporated. Ring-trip detector. 4,447,675, Cl. 179-84.00R.

Aronson, Alfred L. Cardiac arrhythmia analysis system. 4,446,868, Cl. 128-708.000.

Arraudeau, Jean-Pierre: *See—*
Gueret, Jean-Louis H.; and Arraudeau, Jean-Pierre, 4,446,880, Cl. 132-88.500.

Artman, Noel G. Precombustion chamber for internal combustion engine. 4,446,831, Cl. 123-286.000.

Asaeda, Toshio; Suzuki, Ikuo; Imai, Tomoyasu; and Kitajima, Masato, to Toyoda Koki Kabushiki Kaisha; and Toshio Asaeda. Resinoid bonded grinding wheel and method for forming such wheel. 4,446,657, Cl. 51-206.00R.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Ai, Hideo; and Tsuruta, Naohiro, 4,447,580, Cl. 525-121.000.
Sakamoto, Hajimu; Kiyota, Takao; and Hayashi, Hiroshi, 4,447,355, Cl. 260-112.00B.
Takeo, Kimihiko; Hirano, Tooichiro; and Sato, Fumihiko, 4,447,601, Cl. 536-102.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Arai, Yasunori, 4,447,137, Cl. 350-454.000.
Hidaka, Tsuneo; Inoue, Masahide; and Ogiso, Makoto, 4,447,210, Cl. 433-173.000.
Sugiyama, Takahiro; and Hagiwara, Yukio, 4,447,138, Cl. 350-472.000.

Asai, Yoshiharu, to Kabushiki Kaisha Ishida Koki Seisakusho. Method of treating combination defectiveness in combinatorial weighing or counting. 4,446,937, Cl. 177-1.000.

Asano, Masamichi; and Iwahashi, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory device. 4,447,895, Cl. 365-226.000.

Asano, Toshitake, to Ikegai Tekko Kabushiki Kaisha. Tool holder. 4,447,181, Cl. 409-345.000.

Asayama, Yoshiaki: *See—*
Endo, Norio; Asayama, Yoshiaki; and Kabuto, Masami, 4,446,824, Cl. 123-52.00M.

Aschenbruck, Emil: *See—*
Kotzur, Joachim; Reinersmann, Hans H.; Albers, Rolf; Aschenbruck, Emil; and Neuhaus, Gunter, 4,447,063, Cl. 277-80.000.

Ashby, Eugene C., to Ethyl Corporation. Organomagnesium compounds. 4,447,369, Cl. 260-665.00R.

Asher, Eldad B. Electronic lock. 4,447,850, Cl. 361-172.000.

Aston, Graeme, to California Institute of Technology. Ion beam accelerator system. 4,447,773, Cl. 328-233.000.
AT&T Bell Laboratories: *See—*
Panuska, Andrew J.; Santana, Manuel R.; and Sprow, Robert B., 4,446,686, Cl. 57-6.000.
AT&T Technologies, Inc.: *See—*
Hardin, Tommy G.; and Vrieland, Bruce C., 4,446,689, Cl. 57-204.000.
Panuska, Andrew J.; Santana, Manuel R.; and Sprow, Robert B., 4,446,686, Cl. 57-6.000.
Ateliers et Chantiers de Bretagne A.C.B.: *See—*
Colin, Jean P., 4,446,808, Cl. 114-248.000.
Atlantic Richfield Company: *See—*
Gaffney, Anne M.; and Sofranko, John A., 4,447,638, Cl. 560-204.000.
Sofranko, John A.; and Gaffney, Anne M., 4,447,639, Cl. 560-204.000.
Wolcott, Herbert B., Jr., 4,446,918, Cl. 166-245.000.
Atlas Copco Aktiebolag: *See—*
Nilsson, Hans Gosta; and Nilsson, Kurt A. G., 4,446,930, Cl. 173-29.000.
Attia, Alan I.: *See—*
Putt, Ronald A.; and Attia, Alan I., 4,447,471, Cl. 427-98.000.
Audeh, Costandi A.: *See—*
Angevine, Philip J.; Audeh, Costandi A.; Tabak, Samuel A.; and Yan, Tsoung Y., 4,447,312, Cl. 208-46.000.
Audi Nsu Auto Union Aktiengesellschaft: *See—*
Bauder, Armin; and Ohrnberger, Gerd, 4,446,828, Cl. 123-196.00R.
August Stork KG: *See—*
Adolf, Lutz-Erdmut; and Oberwelland, Klaus, 4,447,202, Cl. 425-434.000.
Aula, Howard A.: *See—*
Ackerman, Allen D.; and Aula, Howard A., 4,446,906, Cl. 164-112.000.
Ausonia Farmaceutici s.r.l.: *See—*
Quadro, Giuseppe, 4,447,419, Cl. 424-177.000.
Automobiles Citroen: *See—*
Nigon, Michel, 4,447,683, Cl. 200-61.270.
Automobiles Peugot: *See—*
Nigon, Michel, 4,447,683, Cl. 200-61.270.
Aviation Chemical, Inc.: *See—*
Rippstein, Wayland J., Jr., 4,447,413, Cl. 424-78.000.
AVL AG: *See—*
Marsoner, Hermann J.; and Savora, Gunther, 4,446,872, Cl. 128-700.000.
Ayerst, McKenna & Harrison Inc.: *See—*
Sestanj, Kazimir, 4,447,452, Cl. 424-319.000.
Azuma, Yusaku; Kitayama, Yoshifumi; and Ozawa, Chiaki, to Bridgestone Tire Company Limited. Tire component assembly. 4,447,014, Cl. 242-55.000.
B. F. Goodrich Company, The: *See—*
Bartley, Donald R.; and Haase, James M., 4,447,197, Cl. 425-28.00R.
Klein, Richard G.; and Houck, Robert J., 4,447,807, Cl. 340-676.000.
Baatz, Henning; Rittscher, Dieter; and Wriegt, Jurgen, to GNS Gesellschaft fur Nuklear-Service mbH. Radiation-shielding transport and storage container and method of packaging radioactive material. 4,447,733, Cl. 250-506.100.
Babcock & Wilcox Company, The: *See—*
Youmans, Barry J.; and Zimmerlin, Sharon L., 4,447,780, Cl. 324-132.000.
Babel, Carl R.: *See—*
Page, Edward A.; and Babel, Carl R., 4,447,123, Cl. 350-96.240.
Babineaux, David, III. Method of treating waste water. 4,447,330, Cl. 210-717.000.
Bacharach Instrument Company: *See—*
Anouchi, Abraham Y.; Novack, Robert L.; and Tomasovic, Beth, 4,447,397, Cl. 422-94.000.
Bailey, Wilber H., to Camino Laboratories, Inc. Transducer calibration system. 4,446,715, Cl. 73-1.00R.
Bainbridge, Robert W.: *See—*
Dannels, W. Andrew; and Bainbridge, Robert W., 4,447,386, Cl. 264-328.200.
Bakas, Steve T.: *See—*
Lamb, Paul R.; Bakas, Steve T.; and Wood, Brian M., 4,447,315, Cl. 208-99.000.
Baker International Corporation: *See—*
Stone, Lyndon R.; and Hall, James D., 4,446,745, Cl. 73-862.250.
Baker Oil Tools, Inc.: *See—*
Bowyer, Michael L.; and Whiteford, Drummond, 4,446,922, Cl. 166-322.000.
Baker Perkins Inc.: *See—*
Karian, Harutun G.; and Todd, David B., 4,447,383, Cl. 264-8.000.
Baker, Robert G., to Nordson Corporation. Electrically heated multisection hose having electrically heated hose joints. 4,447,707, Cl. 219-301.000.
Balboni, John J.; and Hong, Leon. Preparation of par-fried potato pieces. 4,447,459, Cl. 426-441.000.
Baldoni, Viscardo; and Vorih, William J., to Firestone Tire & Rubber Company, The. Demountable sealed joint for the fluid tight connection of a sheet member to a support. 4,447,171, Cl. 403-381.000.
Ball Valve Co., Inc.: *See—*
Bunn, Stuart E.; and Owsely, Herbert B., 4,447,193, Cl. 417-441.000.
Bally Manufacturing Corporation: *See—*
Tojza, Roman A., 4,447,058, Cl. 273-121.00A.
Balser, Donald S.: *See—*
Teranishi, Roy; Murphy, Edwin L.; Balser, Donald S.; and Howard, Walter E., 4,446,648, Cl. 43-131.000.
Ban, Itsuki; Shiraki, Manabu; and Egami, Kazuhito. Direct current motor. 4,447,751, Cl. 310-154.000.
Bandiera, Jean: *See—*
Hamon, Christian; Bandiera, Jean; and Senes, Michel, 4,447,669, Cl. 585-640.000.
Banner/Technical Devices Company, Inc.: *See—*
Allen, Melvin K.; Berri, Ronald J.; and Winther, Douglas N., 4,447,001, Cl. 228-37.000.
Banta, Frederick, to Mobil Oil Corporation. Demetalation, desulfurization, and decarbonization of petroleum oils by hydrotreatment in a dual bed system prior to cracking. 4,447,314, Cl. 208-89.000.
Bapst, Jean-Daniel: *See—*
Boisvert, Pierre U.; and Bapst, Jean-Daniel, 4,447,279, Cl. 156-61.000.
Barcana Ltee: *See—*
Boisvert, Pierre U.; and Bapst, Jean-Daniel, 4,447,279, Cl. 156-61.000.
Barni, John J.: *See—*
Holt, Luther D., 4,447,767, Cl. 318-139.000.
Barr, Robert M. S.: *See—*
Reed, Leonard W.; Barr, Robert M. S.; and Dick, David A., 4,447,199, Cl. 425-182.000.
Barthelat, Rene; and Dore, Alain, to Societe d'Applications Generales d'Electricite et de Mechanique Sagem. Periscopic installations with multi sighting heads for submarines. 4,447,129, Cl. 350-302.000.
Bartholomew, David: *See—*
Kay, Ian T.; Bartholomew, David; Williams, Emyr G.; and Noon, Robert A., 4,447,446, Cl. 424-282.000.
Bartlett, Allen J.: *See—*
Peterson, John F.; and Bartlett, Allen J., 4,446,702, Cl. 62-55.500.
Bartley, Donald R.; and Haase, James M., to B. F. Goodrich Company, The. Tire mold with air vent inserts. 4,447,197, Cl. 425-28.00R.
Bartosevich, Joseph F.: *See—*
Klayman, Daniel L.; Scovill, John P.; Bartosevich, Joseph F.; Mason, Carl J.; and Griffin, T. Scott, 4,447,427, Cl. 424-244.000.
BASF Aktiengesellschaft: *See—*
Henne, Andreas; Hesse, Anton; Jacobi, Manfred; Schornick, Gunnar; Vyvial, Rudolf; and Holoch, Klaus, 4,447,520, Cl. 430-281.000.
Horn, Peter; Gehm, Robert; Marx, Matthias; and Roeber, Artur, 4,447,561, Cl. 521-118.000.
Reuther, Wolfgang; and Borck, Hans-Volker, 4,447,448, Cl. 424-285.000.
Schott, Eberhard P.; and Lang, Hans, 4,447,255, Cl. 71-86.000.
Steiner, Gerd; Hofmann, Hans P.; Kreiskott, Horst; Teschendorf, Hans-Juergen; and Lenke, Dieter, 4,447,610, Cl. 544-381.000.
Bass, Steven C., to Kimball International, Inc. Digital tone generation system utilizing fixed duration time functions. 4,446,770, Cl. 84-1.010.
Battelle-Institut e.V.: *See—*
Deibig, Heinrich; and Wollmann, Klaus, 4,447,477, Cl. 427-388.300.
Batterton, Elmo L.; and Lonsdale, Melvin J., to Meyer Morton Company. Air system for continuous flow grain dryer. 4,446,631, Cl. 34-65.000.
Bauder, Armin; and Ohrnberger, Gerd, to Audi Nsu Auto Union Aktiengesellschaft. Reciprocating internal combustion engine. 4,446,828, Cl. 123-196.00R.
Baum, Eric A.; Davies, Leslie J.; Kirk, William F.; and Wass, Anthony C. L. Breath actuated devices for administering powdered medicaments. 4,446,862, Cl. 128-203.150.
Baumberger, Otto: *See—*
Kalbskopf, Reinhard; Baumberger, Otto; and Masson, Serge, 4,446,815, Cl. 118-718.000.
Baxter Travenol Laboratories, Inc.: *See—*
Bilstad, Arnold C.; and Foley, John T., 4,447,191, Cl. 417-12.000.
Bayer Aktiengesellschaft: *See—*
Busse, Wolf-Dieter; Krauthausen, Edmund; and Mardin, Mithat, 4,447,440, Cl. 424-269.000.
Dickore, Karlfried; Sasse, Klaus; Eue, Ludwig; and Schmidt, Robert R., 4,447,258, Cl. 71-93.000.
Dickore, Karlfried; and Kuhle, Engelbert, 4,447,635, Cl. 560-115.000.
Hocker, Jurgen; Dhein, Rolf; and Merten, Rudolf, 4,447,583, Cl. 525-328.100.
Hoppe, Hans-Georg; and Henrichs, Paul, 4,447,486, Cl. 428-318.600.
Oediger, Hermann; Lieb, Folker; and Disselnkotter, Hans, 4,447,367, Cl. 260-502.40R.
Schellhammer, Carl-Wolfgang; and Wehling, Bernhard, 4,447,651, Cl. 568-645.000.
Wehling, Bernhard, 4,447,244, Cl. 8-514.000.
Werner, Friedrich; Mannes, Karl; and Trescher, Viktor, 4,447,647, Cl. 564-412.000.
Bayha, Charles E., to Alpha Corporation of Tennessee. Emulsions of dicyclopentadiene containing polyesters. 4,447,577, Cl. 524-845.000.
BBC Brown, Boveri & Company, Limited: *See—*
Czech, Franz; and Subotic, Miroslav, 4,447,671, Cl. 174-28.000.
Bean, Vern E.; and Long, Frederick G., to United States of America, Energy. High pressure liquid level monitor. 4,447,743, Cl. 307-118.000.
Bearcroft, Kenneth E., to ITT Industries, Incorporated. Ultrasonic flowmeter. 4,446,744, Cl. 73-861.280.

Beasley, J. Donald, to Gould, Inc. Apparatus for maintaining an optical fiber and a focusing means. 4,447,119, Cl. 350-96.180.
Becker, Kunibert; Dunkel, Gerd; Lagodka, Gunter; and Kirchbrucher, Rudiger, to Gewerkschaft Eisenhutte Westfalia. Cap positioning mechanism. 4,447,174, Cl. 405-293.000.
Becker, William M.; and Becker, William R., to Gladstone Furnace Company, Inc. Fireplace insert construction. 4,446,848, Cl. 126-121.000.
Becker, William R.: *See*—
Becker, William M.; and Becker, William R., 4,446,848, Cl. 126-121.000.
Beckhardt, Robert L.: *See*—
Reeb, Irvin H., Jr.; and Beckhardt, Robert L., 4,447,749, Cl. 310-71.000.
Bedu, Marcel; and Jeanjean, Marcel, to Commissariat a l'Energie Atomique. Supply device for a flash tube. 4,447,766, Cl. 315-241.00R.
Beecham Group p.l.c.: *See*—
Taylor, Andrew W.; and Adams, Richard G., 4,447,422, Cl. 424-229.000.
Beele, Gunther, to Klockner-Humboldt-Deutz AG. Apparatus for adding strongly reacting materials into a melt. 4,447,046, Cl. 266-216.000.
Begrich, Rainer: *See*—
Holzle, Gerd; and Begrich, Rainer, 4,447,357, Cl. 260-153.000.
Behle, Gunter R., to ACF Industries, Incorporated. Bottom operable tank car valve having external rotation stop. 4,447,039, Cl. 251-144.000.
Behre, H. Evan: *See*—
Menache-Aronson, Doris; Kosow, David P.; Orthner, Carolyn L.; and Behre, H. Evan, 4,447,416, Cl. 424-101.000.
Beinglass, Israel; and Tsai, Nan-Hsiung, to Intel Corporation. Integrated circuit resistor and method of fabrication. 4,446,613, Cl. 29-571.000.
Beisch, Hans R., to NI Industries, Inc. Wheel trim retention. 4,447,092, Cl. 301-37.00P.
Bekkering, Hendrik M., to Duphar International Research B.V. Automatic injection syringe. 4,447,231, Cl. 604-131.000.
Bell, Dwain C.; Anderson, Lloyd E.; and Anderson, Martin L., to National Carpet Jobbers, Inc. Carpet steaming tool. 4,446,593, Cl. 15-322.000.
Bell Maschinenfabrik Aktiengesellschaft: *See*—
Britschgi, Hugo; and Rosenberg, Burkard, 4,447,334, Cl. 210-783.000.
Bell, Stanley C.: *See*—
Klaubert, Dieter H.; and Bell, Stanley C., 4,447,611, Cl. 546-118.000.
Bell Telephone Laboratories, Incorporated: *See*—
Arntsen, Tom D.; and Toumani, Rouben, 4,447,675, Cl. 179-84.00R.
Chin, Aland K.; DiGiuseppe, Michael A.; and Temkin, Henryk, 4,447,822, Cl. 357-17.000.
Cohen, Leonard G., 4,447,124, Cl. 350-96.300.
Cohen, Leonard G.; Mammel, Wanda L.; and Marcuse, Dietrich, 4,447,127, Cl. 350-96.330.
Dixon, Richard W.; Koszi, Louis A.; Miller, Richard C.; and Schwartz, Bertram, 4,447,905, Cl. 372-46.000.
Hartman, Adrian R.; Kohl, James E.; MacPherson, William F.; and Riley, Terence J., 4,447,744, Cl. 307-252.00R.
Lazay, Paul D.; Lemaire, Paul J.; and Pearson, Arthur D., 4,447,125, Cl. 350-96.300.
Bender, Fred: *See*—
Zauner, Otto; and Bender, Fred, 4,446,960, Cl. 198-408.000.
Bendix Corporation, The: *See*—
Dyce, John W.; Waters, Edwin R.; and Sherwood, Cy E., 4,447,100, Cl. 339-14.00R.
Elpern, David G., 4,446,837, Cl. 123-460.000.
Punsko, Stephen; Davis, Alan L.; and Eifler, Raymond J., 4,447,110, Cl. 339-262.0RR.
Van Siclen, Howard E., Jr., 4,446,841, Cl. 123-602.000.
Werth, Dee A.; and Ratchford, Lloyd G., 4,447,103, Cl. 339-94.00M.
Benisek, Ladislav, to Wool Development International Limited. Textile finishing. 4,447,242, Cl. 8-128.00R.
Benson, Glendon M., to New Process Industries, Inc. Isothermalizer system. 4,446,698, Cl. 60-520.000.
Benson, John; and Hanel, Harold L., to International Telephone and Telegraph Corporation. Powder actuated tool safety guard retention. 4,446,999, Cl. 227-11.000.
Bentley Laboratories: *See*—
Heinemann, Stanley O., 4,447,150, Cl. 356-41.000.
Ber-Vac Inc.: *See*—
Vachon, Bertrand, 4,446,925, Cl. 172-142.000.
Berck, Michel F. D. J.: *See*—
Schayes, Raymond G. G.; Gustin, Pol A. G. J.; Bodart, Robert; and Berck, Michel F. D. J., 4,447,829, Cl. 358-260.000.
Berg, William C., to Control Data Corporation. Finned heat exchangers for electronic chips and cooling assembly. 4,447,842, Cl. 361-386.000.
Berger, Hans G., to Wickes Corporation, The. Insulated roof structure system and method of erecting same. 4,446,665, Cl. 52-407.000.
Bergeret, Wilfrid; Gautier, Jean-Claude; Raynal, Serge; and Boileau, Sylvie, to Societe Nationale des Poudres et Explosifs. Process for the synthesis of tertiary phosphine oxides and sulphides, and new tertiary phosphine oxides and sulphides. 4,447,584, Cl. 525-340.000.
Bergeron, David L.; and Patel, Parsotam T., to International Business Machines Corporation. Method of making a saturation-limited bipolar transistor device. 4,446,611, Cl. 29-578.000.
Bernal, Eddie L., to Taco Operations, Inc. Readily portable food item. 4,447,457, Cl. 426-91.000.
Berndt, Dieter R., to TRP Energy Sensors, Inc. Temperature-responsive pacifier assembly. 4,447,164, Cl. 374-162.000.
Berri, Ronald J.: *See*—
Allen, Melvin K.; Berri, Ronald J.; and Winther, Douglas N., 4,447,001, Cl. 228-37.000.
Berstein, Seymour: *See*—
Dusza, John P.; Joseph, Joseph P.; and Berstein, Seymour, 4,447,442, Cl. 424-273.00P.
Berthold, Joachim; Diedrich, Bernd; Franke, Rainer; Hartlapp, Jurgen; Schafer, Werner; and Strobel, Wolfgang, to Hoechst Aktiengesellschaft. Process for the preparation of a polyolefin, and a catalyst for this process. 4,447,587, Cl. 526-124.000.
Bertsch, Dieter A.; Finkle, Mark A.; and Fishman, James D. Method and apparatus for the automatic folding of floppy disc storage envelopes. 4,447,218, Cl. 493-251.000.
Beschke, Helmut; Friedrich, Heinz; and Heilos, Johannes, to Degussa Aktiengesellschaft. Catalysts for the production of 3-cyanopyridine. 4,447,612, Cl. 546-285.000.
Beschke, Helmut; Dahm, Franz-Ludwig; Friedrich, Heinz; and Prescher, Gunter, to Degussa Aktiengesellschaft. Process for the purification of nicotinic acid amide. 4,447,614, Cl. 546-316.000.
Beschke, Helmut; Dahm, Franz-Ludwig; Friedrich, Heinz; and Prescher, Gunter, to Degussa Aktiengesellschaft. Process for the purification of nicotinic acid amide I. 4,447,615, Cl. 546-317.000.
Bessho, Hironori, to Toyota Jidosha Kabushiki Kaisha. Internal combustion engine passage construction with intake tubes extending along surge tank wall. 4,446,823, Cl. 123-52.0MB.
Betschler, Joachim, to Holl & CIE GmbH. Method of operating an electroplating system. 4,447,298, Cl. 204-23.000.
Bhagwat, Pradeep: *See*—
Saar, David A.; and Bhagwat, Pradeep, 4,447,786, Cl. 318-811.000.
Bhatti, Mohinder S., to Owens-Corning Fiberglas Corporation. Method of making and using glass fiber forming feeders. 4,447,248, Cl. 65-2.000.
Biber, Klaus, to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Means for securing an observation instrument to a supporting stand. 4,447,139, Cl. 350-522.000.
Bierman, Laurence W.; Long, Gary L.; and Bortner, David, to J. R. Simplot Company. Method for autoclave oxidation of ion species aqueous solutions. 4,447,403, Cl. 423-20.000.
Biggs, Delmar A.; and Shields, John. Quantitative measurement of fat, protein and lactose in dairy products. 4,447,725, Cl. 250-339.000.
Bilstad, Arnold C.; and Foley, John T., to Baxter Travenol Laboratories, Inc. Control circuit for a blood fractionation apparatus. 4,447,191, Cl. 417-12.000.
Bilton, Gerald L. Enzyme-containing digestive aid compostions. 4,447,412, Cl. 424-16.000.
Biss, Edgar L., to Perkam Limited. Apparatus and method for measuring the number and/or value of an unknown quantity of articles. 4,447,885, Cl. 364-568.000.
Bjork, Anders K. K.; Olsson, Knut G.; Abramo, Aina L.; and Christensson, Erik G., to AB Ferrosan. Diphenylbutyl-piperazinecarboxamides to treat pain. 4,447,433, Cl. 424-250.000.
Bjornholt, John E.; Foster, Richard G.; and Groth, Edward J., Jr., to Motorola Inc. Multiple mixer spread spectrum modulation and method therefor. 4,447,907, Cl. 375-1.000.
Black, Charles E., III: *See*—
Schaad, William J.; Black, Charles E., III; and Halstead, Raymond T., 4,447,688, Cl. 200-159.00R.
Black & Decker Inc.: *See*—
Dynie, Ernest R.; and Overy, Colin, 4,446,681, Cl. 56-16.700.
Reeb, Irvin H., Jr.; and Beckhardt, Robert L., 4,447,749, Cl. 310-71.000.
Saar, David A.; and Bhagwat, Pradeep, 4,447,786, Cl. 318-811.000.
Black, Leslie. Banana peeling machine. 4,446,782, Cl. 99-589.000.
Blake, Larry W. Intraocular lens with free-ended sizing prong. 4,446,581, Cl. 3-13.000.
Blakeslee, Theodore R., III; and Wu, Randall, to Union Carbide Corporation. Process for manufacture of tubular film. 4,447,387, Cl. 264-566.000.
Blanchart, Alain P. O., to Electrochemische Energieconversie, N.V. Fuel cell electrode. 4,447,505, Cl. 429-42.000.
Blandford, Stephen. Coupling with overload protection. 4,447,217, Cl. 464-32.000.
Blank, Heinz U.: *See*—
Emde, Herbert; Blank, Heinz U.; and Schnegg, Peter, 4,447,368, Cl. 260-508.000.
Blaschke, Felix: *See*—
Schwesig, Guenter; and Blaschke, Felix, 4,447,787, Cl. 318-803.000.
Blase, Emil F.: *See*—
MacNamee, Richard W.; Reese, Morris T.; and Blase, Emil F., 4,447,346, Cl. 252-62.200.
Bleicher, Manfred; Buck, Manfred; Falchle, Jorg; and Wanner, Karl, to Robert Bosch GmbH. Power driven hammer drill. 4,446,931, Cl. 173-48.000.
Blewett, Charles W., to National Distillers and Chemical Corporation. Decomposition of polycarbonates to form terminally unsaturated alcohols. 4,447,659, Cl. 568-876.000.
Block, Jacob, to W. R. Grace & Co. Clay stabilizer composition for aqueous drilling fluids. 4,447,341, Cl. 252-8.50A.
Block, Myron J.: *See*—
Hirschfeld, Tomas E., 4,447,546, Cl. 436-527.000.

Blomgren, Rolf B. J. R.: *See*—
Jonsson, Jan U. E.; Blomgren, Rolf B. J. R.; and Edlund, Nils H., 4,446,661, Cl. 52-95.000.
Blosser, Virgil Y.; Isaksson, G. E.; Rupp, Dallas B.; and Singh, A. P., to NRM Corporation. Tire press, loader and method. 4,447,385, Cl. 264-315.000.
Blough, LeVone A.; and Gregory, David L. Mortice cylinder lock wrench structures. 4,446,763, Cl. 81-90.00B.
Blough, LeVone A.; and Gregory, David L. Template for mortice cylinder lock removal. 4,447,176, Cl. 408-72.00R.
Bobb, Lloyd C., to United States of America, Navy. Gated fiber optic transmission. 4,447,117, Cl. 350-96.150.
Boberg, Richard W.: *See*—
Kinnie, D. Craig; and Boberg, Richard W., 4,447,878, Cl. 364-200.000.
Bocchiaro, Augustino. Automatic cable stop for towing winch. 4,447,043, Cl. 254-269.000.
Bock, Siegfried; and Huetter, Horst, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Carrier for a dropload to be dropped from an aircraft. 4,447,025, Cl. 244-118.200.
Bockrath, Ronald E.: *See*—
Keske, Robert G.; Brooks, Gary T.; and Bockrath, Ronald E., 4,447,574, Cl. 524-400.000.
Bodart, Robert: *See*—
Schayes, Raymond G. G.; Gustin, Pol A. G. J.; Bodart, Robert; and Berck, Michel F. D. J., 4,447,829, Cl. 358-260.000.
Boden, Richard M.; Licciardello, Michael; and Tyszkiewicz, Theodore J., to International Flavors & Fragrances Inc. 2-Ethyl hexyl and isobornyl methyl carbonates. 4,447,365, Cl. 260-463.000.
Bodine, Albert G. Rotary earth boring drill bit with centrifugal lubrication system. 4,446,933, Cl. 175-229.000.
Bodlovic, Tonko. Articulated luggage carrier. 4,447,088, Cl. 297-217.000.
Boeckmann, Eduard F. B.: *See*—
Grantland, Gary; Montgomery, Hugh S.; Boeckmann, Eduard F. B.; and Woodworth, Larry A., 4,447,674, Cl. 179-81.00R.
Boehm, Peter, to ITT Industries, Inc. Pre-assembled two-stage reaction device for vacuum brake boosters. 4,447,897, Cl. 91-369.00B.
Boeing Company, The: *See*—
Maraghe, Alex, 4,447,026, Cl. 244-129.500.
Mulkey, Owen R., 4,447,118, Cl. 350-96.160.
Wang, Timothy, 4,447,027, Cl. 244-212.000.
Wang, Timothy, 4,447,028, Cl. 244-212.000.
Bohn, Donald L. Angling snow blade. 4,446,639, Cl. 37-280.000.
Boileau, Sylvie: *See*—
Bergeret, Wilfrid; Gautier, Jean-Claude; Raynal, Serge; and Boileau, Sylvie, 4,447,584, Cl. 525-340.000.
Boisvert, Pierre U.; and Japat, Jean-Daniel, to Barcana Ltee. Automatic artificial tree. 4,447,279, Cl. 156-61.000.
Bollian, Erwin, to Dr. Eugen Durrwachter Doduco KG. Process for the production of bi-metallic contact rivets. 4,446,618, Cl. 29-882.000.
Bolton, Brent C.; Hagenmaier, Carl F., Jr.; Logsdon, Gary L.; and Miner, Robert L., Jr., to Burroughs Corporation. Reduction processor for executing programs stored as treelike graphs employing variable-free applicative language codes. 4,447,875, Cl. 364-200.000.
Bomin Bochumer Mineralol GmbH & Co.: *See*—
Brennecke, Peter W. R.; Ewe, Henning; and Justi, Eduard W., 4,447,302, Cl. 204-128.000.
Bone, Michael C.: *See*—
King, George D. H.; and Bone, Michael C., 4,447,116, Cl. 350-96.130.
Bone, Rainer: *See*—
Boning, Bernward; Bone, Rainer; Nagel, Rudolf; Sellmaier, Franz; and Reum, Helmut, 4,446,723, Cl. 73-35.000.
Boning, Bernward; Bone, Rainer; Nagel, Rudolf; Sellmaier, Franz; and Reum, Helmut, to Robert Bosch GmbH. Optical combustion event sensor structure particularly knock sensor for an internal combustion engine. 4,446,723, Cl. 73-35.000.
Book, Gerard, to SECEMIA. Method and apparatus for slow cooling of heated grain. 4,446,630, Cl. 34-65.000.
Boots Company PLC, The: *See*—
Davies, Roy V., 4,447,435, Cl. 424-258.000.
Borchardt, John K.; and Brown, David L., to Halliburton Co. Method of clay stabilization in enhanced oil recovery. 4,447,342, Cl. 252-8.55D.
Borck, Hans-Volker: *See*—
Reuther, Wolfgang; and Borck, Hans-Volker, 4,447,448, Cl. 424-285.000.
Borg-Warner Corporation: *See*—
Lech, Thaddeus, Jr., 4,446,955, Cl. 192-106.200.
Borsuk, Leslie M., to International Telephone & Telegraph Corporation. Fiber optic cable clamp. 4,447,120, Cl. 350-96.200.
Bortner, David: *See*—
Bierman, Laurence W.; Long, Gary L.; and Bortner, David, 4,447,403, Cl. 423-20.000.
Boruschewitz, Manfred; and Hamisch, Hansjoachim, to Robert Bosch GmbH. Vibration sensor, particularly knock sensor for internal combustion engines. 4,446,722, Cl. 73-35.000.
Bose, Herbert. Warning light. 4,447,802, Cl. 340-119.000.
Botzem, Werner; Knappe, Ortwin; and Laug, Reiner, to Transnuklear GmbH. Transportation and/or storage containers for radioactive materials. 4,447,730, Cl. 250-506.100.
Boudjouk, Philip R., to North Dakota State University. Ultrasonically promoted hydrosilations. 4,447,633, Cl. 556-479.000.
Bowen, Gary D.; and Bowen, James L., to Genpak Corporation. Fluid tight container and closure assembly. 4,446,986, Cl. 220-307.000.
Bowen, James L.: *See*—
Bowen, Gary D.; and Bowen, James L., 4,446,986, Cl. 220-307.000.
Bowyer, Michael L.; and Whiteford, Drummond, to Baker Oil Tools, Inc. Adjustable safety valve. 4,446,922, Cl. 166-322.000.
Boyadjieff, George I; and Monahan, Frederick A., to Varco International, Inc. Pipe spinning tool. 4,446,761, Cl. 81-57.190.
Boyce, Arthur J.; and Gold, David, to Charles Stark Draper Laboratory, Inc., The. Ball contact slip ring assembly. 4,447,752, Cl. 310-232.000.
Boyce, Gregory H.: *See*—
Davis, Larry A.; Boyce, Gregory H.; Mulloy, Timothy P.; Nebeker, Neil J.; Newman, Elmer C.; Quinn, Donald J.; and Adamson, David L., 4,447,307, Cl. 204-267.000.
Boyle, John T. A.: *See*—
Archibald, John L.; and Boyle, John T. A., 4,447,604, Cl. 544-219.000.
Bozik, John E.: *See*—
Pretzer, Wayne R.; Kobylinski, Thaddeus P.; and Bozik, John E., 4,447,557, Cl. 502-161.000.
Brackman, Warren A., to Rothmans of Pall Mall Canada Limited. Tobacco metering and feeding system. 4,446,876, Cl. 131-110.000.
Bradbury, John A.; Rowlands, Reuben; and Tipping, James W., to Imperial Chemical Industries Plc. Network of bonded expanded polystyrene beads having chemically delaminated vermiculite impregnant. 4,447,491, Cl. 428-304.400.
Bradford, Donald C.: *See*—
Stafford, George C.; and Bradford, Donald C., 4,447,728, Cl. 250-423.00R.
Bradford, Larry R.: *See*—
Clinefelter, Richard L.; and Bradford, Larry R., 4,446,903, Cl. 152-323.000.
Bradley, John J.; Franklin, Benjamin S.; Slosberg, David M.; Appell, Marc; Cassonnet, Jean-Claude; and De Sabatier, Philippe D., to Compagnie Honeywell Bull. Apparatus and method for communication of information between processes in an information system. 4,447,874, Cl. 364-200.000.
Bradley, Kirk D.; Koski, Robert R.; and Clark, James W., to Envirotech Corporation. Suspension for pivotally mounting a rigid axle assembly. 4,447,072, Cl. 280-492.000.
Brady, John D.: *See*—
Gula, John A.; Brady, John D.; Thompson, Thomas C.; and Alt, Joyce M., 4,447,230, Cl. 604-122.000.
Braithwaite, John C.: *See*—
Sharp, Michael R. G.; and Braithwaite, John C., 4,447,777, Cl. 324-220.000.
Brandstadter, Jack M., to Ex-Cell-O Corporation. Road wheel suspension. 4,447,073, Cl. 280-705.000.
Brannen, Wyley W., to Callaway Brothers, Inc. Gasketless no-drip oil can dispenser. 4,446,989, Cl. 222-81.000.
Brannstrom, Bo: *See*—
Kristiansen, Olaf; and Brannstrom, Bo, 4,446,804, Cl. 114-74.00R.
Branscombe, Richard: *See*—
Oliver, Robert; and Branscombe, Richard, 4,446,980, Cl. 215-276.000.
Brantingham, George L.; Lou, Perry W.; Housey, Lawrence J.; Tubbs, Graham S.; and Teza, Jeffrey R., to Texas Instruments Incorporated. Data processing system integrated circuit having modular memory add-on capacity. 4,447,881, Cl. 364-488.000.
Bray, Christopher: *See*—
Miller, Russell S.; Dietz, Peter W.; and Bray, Christopher, 4,446,910, Cl. 165-1.000.
Brecker, Lawrence R.; Keeley, Charles; and Brilliant, Stuart D., to Argus Chemical Corporation. Polyvinyl chloride resin compositions having a high volume resistivity and resistance to deterioration when heated at temperatures above 100 degrees C. 4,447,569, Cl. 524-109.000.
Bredow, Walter, to C. Behrens AG. A tool for exchanging a matrix in a metal working machine. 4,446,609, Cl. 29-270.000.
Breier, Walter: *See*—
Arndt, Manfred; Breier, Walter; Riegert, Hermann; Schmidt, Heinz; Schwarz, Hermann; and Warneke, Helmut, 4,446,978, Cl. 215-13.00R.
Bremer, Mary E. Carry cover art oil canvas. 4,446,968, Cl. 206-451.000.
Brennecke, Peter W. R.; Ewe, Henning; and Justi, Eduard W., to Bomin Bochumer Mineralol GmbH & Co. Highly porous electrodes hot pressed from nickel powder for alkaline water electrolyzers. 4,447,302, Cl. 204-128.000.
Bressi, Nick. Rotary indicator. 4,446,810, Cl. 116-307.000.
Breukelman, Robert G.: *See*—
Karubian, Ralph; Breukelman, Robert G.; and Weston, Lynn R., 4,446,598, Cl. 17-1.00B.
Breuker, Stephen J.; and Richmann, Harold L., to Gerber Products Company. Apparatus and method for continuous pH monitoring. 4,447,775, Cl. 324-438.000.
Breuninger, Manfred W., to Hoffmann-La Roche Inc. Process for the manufacture of citral. 4,447,649, Cl. 568-484.000.
Brewer, Ralph J.: *See*—
Bruce, Charles W.; and Brewer, Ralph J., 4,446,721, Cl. 73-29.000.
Bridgestone Tire Company Limited: *See*—
Azuma, Yusaku; Kitayama, Yoshifumi; and Ozawa, Chiaki, 4,447,014, Cl. 242-55.000.
Endo, Kazuyuki; and Makino, Shigeo, 4,446,901, Cl. 152-209.00R.
Tamura, Akira; and Suzuki, Yasuo, 4,446,905, Cl. 152-361.0DM.
Brilliant, Stuart D.: *See*—
Brecker, Lawrence R.; Keeley, Charles; and Brilliant, Stuart D., 4,447,569, Cl. 524-109.000.

British Aerospace Public Limited Company: *See*—
Humphries, Martin E., 4,446,662, Cl. 52-121.000.
British Gas Corporation: *See*—
Sharp, Michael R. G.; and Braithwaite, John C., 4,447,777, Cl. 324-220.000.
Britschgi, Hugo; and Rosenberg, Burkard, to Bell Maschinenfabrik Aktiengesellschaft. Method for the dewatering of lump peat. 4,447,334, Cl. 210-783.000.
Brochier, Michel; and Chavand, Jean, to Commissariat a l'Energie Atomique. Apparatus for breaking up metal parts. 4,447,694, Cl. 219-68.000.
Broney, Scott C.: *See*—
Chesney, Joseph J., Jr.; and Broney, Scott C., 4,447,267, Cl. 106-93.000.
Bronicki, Lucien Y.; Hershman, Haim; and Lehmann, Gerard, to Solmat Systems, Ltd. Solar pond power plant and method of operating the same as a part of an electrical generating system. 4,446,700, Cl. 60-641.800.
Brookes, Malcolm J.: *See*—
Heinzelman, Bert D.; Spranger, Douglas M.; Brookes, Malcolm J.; and Kuphal, John E., 4,447,482, Cl. 428-42.000.
Brooks, Gary T.: *See*—
Keske, Robert G.; Brooks, Gary T.; and Bockrath, Ronald E., 4,447,574, Cl. 524-400.000.
Brooks, Le Ester. Bicycle drive mechanism. 4,447,068, Cl. 280-260.000.
Brother Kogyo Kabushiki Kaisha: *See*—
Aoshima, Shozo; Hirose, Noboru; and Ishikawa, Michio, 4,446,746, Cl. 73-862.330.
Broughton, Donald B., to UOP Inc. Continuous desalination process. 4,447,329, Cl. 210-673.000.
Brown, Clyde O., to United States of America, Energy. Slag capture and removal during laser cutting. 4,447,701, Cl. 219-121.0LG.
Brown, David L.: *See*—
Borchardt, John K.; and Brown, David L., 4,447,342, Cl. 252-8.55D.
Brown Group Recreational Products, Inc.: *See*—
Cunard, Joel C.; and Ziegler, William H., Jr., 4,447,093, Cl. 301-63.0PW.
Brown, Robert E., to United States of America, Navy. Pulse driver for flux gate magnetometer. 4,447,776, Cl. 324-253.000.
Brown & Williamson Tobacco Corporation: *See*—
Porenski, Harry S., Jr., 4,446,878, Cl. 131-336.000.
Bruce, Charles W.; and Brewer, Ralph J., to United States of America, Army. Atmospheric liquid water content measurement and calibration system. 4,446,721, Cl. 73-29.000.
Bruce, Lars M., to Uddeholms Aktiebolag. Method for manufacturing tubes by sintering. 4,447,389, Cl. 419-6.000.
Bubik, Alfred; Dahl, Hans; Holik, Herbert; Kurtz, Rudiger; and Seider, Werner, to Escher Wyss GmbH. Dewatering apparatus for longitudinal wire papermaking machines. 4,447,295, Cl. 162-300.000.
Buck, Manfred: *See*—
Bleicher, Manfred; Buck, Manfred; Falchle, Jorg; and Wanner, Karl, 4,446,931, Cl. 173-48.000.
Buck, Ronald G., to Litton Systems, Inc. Power controlled microwave oven. 4,447,693, Cl. 219-10.55M.
Bucking, Hans-Walter: *See*—
May, Adolf; and Bucking, Hans-Walter, 4,447,343, Cl. 252-8.750.
Buendia, Jean: *See*—
Martel, Jacques; Buendia, Jean; and Nierat, Jeanine, 4,447,637, Cl. 560-124.000.
Buerk, Hermann: *See*—
Schuster-Woldan, Hans; Buerk, Hermann; Koch, Dirk; and Weingand, Kaspar, 4,447,292, Cl. 156-644.000.
Bukowiecki, Stanislaw; and Paglotke, Karlheinz, to Cerberus AG. Method and apparatus for reducing false alarms in gas warning installations caused by spurious gases. 4,446,718, Cl. 73-23.000.
Bullock, James H., to Clairol Incorporated. Hair curlers having PTC electric heating element. 4,447,705, Cl. 219-222.000.
Bumb, George: *See*—
Campagna, Gerald L., 4,446,896, Cl. 141-198.000.
Bumb, Timothy: *See*—
Campagna, Gerald L., 4,446,896, Cl. 141-198.000.
Bunch, Earnest B., Jr. Delivery mechanism for paper sheet processing apparatus. 4,447,219, Cl. 493-410.000.
Bunn, Stuart E.; and Owsely, Herbert B., to Ball Valve Co., Inc. Compressor unloader apparatus. 4,447,193, Cl. 417-441.000.
Buri, Hermann; and Karth, Beat, to Nyffeler, Corti AG. Apparatus for sealing containers. 4,447,184, Cl. 413-26.000.
Burke Industries, Inc.: *See*—
Gerber, Dennis H., 4,446,983, Cl. 220-219.000.
Burkhardt, Gisbert, to Licentia Patent-Verwaltungs G.m.b.H. Conveying device with pusher fingers. 4,446,962, Cl. 198-457.000.
Burnham, Robert D., to Xerox Corporation. Semiconductor devices with nonplanar characteristics produced in chemical vapor deposition. 4,447,904, Cl. 372-45.000.
Burroughs Corporation: *See*—
Bolton, Brent C.; Hagenmaier, Carl F., Jr.; Logsdon, Gary L.; and Miner, Robert L., Jr., 4,447,875, Cl. 364-200.000.
Shapiro, Ira P., 4,447,798, Cl. 377-55.000.
Burtis, Wilson A. Aircraft propulsion assembly. 4,446,695, Cl. 60-200.100.
Busch, Frank R. Carburetor. 4,447,371, Cl. 261-44.00E.
Bush, Randall G.: *See*—
Gach, Peter P.; and Bush, Randall G., 4,446,979, Cl. 215-203.000.
Buss, Waldeen C., to Chevron Research Company. Composition and a method for its use in dehydrocyclization of alkanes. 4,447,316, Cl. 208-138.000.
Busse, Wolf-Dieter; Krauthausen, Edmund; and Mardin, Mithat, to Bayer Aktiengesellschaft. Sulphenamides-containing lipoxygenase inhibiting agents and their use in pharmaceutical compositions. 4,447,440, Cl. 424-269.000.
Butterfield Group: *See*—
Butterfield, Ida M., 4,447,229, Cl. 604-111.000.
Butterfield, Ida M., to Butterfield Group. Tamper-resistant hypodermic syringe. 4,447,229, Cl. 604-111.000.
Butuk, Fred N.: *See*—
Machnee, Cecil; and Butuk, Fred N., 4,446,801, Cl. 111-86.000.
Buxton, James L.: *See*—
Wilson, David A.; Buxton, James L.; and Green, Philip S., 4,446,740, Cl. 73-626.000.
C. Behrens AG: *See*—
Bredow, Walter, 4,446,609, Cl. 29-270.000.
C. Conradty Nurnberg GmbH & Co. Kg: *See*—
Zollner, Dieter H.; Lauterbach-Dammler, Inge; and Rittmann, Friedrich, 4,447,300, Cl. 204-67.000.
Calderwood, Murray W.: *See*—
Ferguson, James H.; and Calderwood, Murray W., 4,447,739, Cl. 290-52.000.
California Institute of Technology: *See*—
Aston, Graeme, 4,447,773, Cl. 328-233.000.
Callaway Brothers, Inc.: *See*—
Brannen, Wyley W., 4,446,989, Cl. 222-81.000.
Calvert, Alan H.: *See*—
Jones, Terence R.; Harrap, Kenneth R.; and Calvert, Alan H., 4,447,608, Cl. 544-287.000.
Cama, Lovji D.: *See*—
Firestone, Raymond A.; Cama, Lovji D.; and Christensen, Burton G., 4,447,602, Cl. 544-21.000.
Cambridge Instruments Limited: *See*—
Crawley, John A., 4,446,817, Cl. 118-725.000.
Camino Laboratories, Inc.: *See*—
Bailey, Wilber H., 4,446,715, Cl. 73-1.00R.
Campagna, Gerald L., to Bumb, George; and Bumb, Timothy. Cup filling apparatus. 4,446,896, Cl. 141-198.000.
Campana, Jerry M.; and Day, Richard B., to United States of America, Navy. Net recovery device and method. 4,447,083, Cl. 294-66.00R.
Campbell, David A., to Rolls-Royce Limited. Fluid pressure control in a gas turbine engine. 4,447,190, Cl. 416-95.000.
Campbell, Jeptha E.; and Gilchrist, James E. Microscope slides. 4,447,140, Cl. 350-534.000.
Canadian CoOperative Implements Limited: *See*—
Rempel, William; and Kor, Bouko J., 4,446,683, Cl. 56-296.000.
Canadian General Electric Company Limited: *See*—
Ferguson, James H.; and Calderwood, Murray W., 4,447,739, Cl. 290-52.000.
Canadian Patents & Development Limited: *See*—
Malatesta, Vincenzo; Willis, Clive; and Hackett, Peter A., 4,447,304, Cl. 204-157.10R.
Canon Kabushiki Kaisha: *See*—
Hirata, Noritsugu; Takimoto, Hiroyuki; and Maeda, Masaya, 4,447,837, Cl. 360-33.100.
Kitamura, Takashi, 4,447,136, Cl. 350-432.000.
Matsuoka, Kazuhiko; and Minoura, Kazuo, 4,447,112, Cl. 350-6.500.
Soma, Tsunenori, 4,447,131, Cl. 350-333.000.
Terasawa, Koji, 4,447,820, Cl. 346-140.00R.
Yamada, Yu, 4,447,147, Cl. 355-51.000.
Carl Freudenberg, Firma: *See*—
Ehrmann, Peter; Fuchs, Dieter; and Spies, Karl-Heinrich, 4,447,064, Cl. 277-134.000.
Carl Schenck AG: *See*—
Schoenfeld, Harald, 4,446,732, Cl. 73-461.000.
Carl-Zeiss-Stiftung: *See*—
Kreuttner, Albert, 4,447,372, Cl. 264-2.200.
Carl-Zeiss-Stiftung, Heidenheim/Brenz: *See*—
Biber, Klaus, 4,447,139, Cl. 350-522.000.
Carlson, Richard O., to General Electric Company. High temperature thermistor and method of assembling the same. 4,447,799, Cl. 338-22.00R.
Carlson, Ronald R.: *See*—
Wilson, Kermit H.; and Carlson, Ronald R., 4,446,796, Cl. 108-69.000.
Carlsson, Rune: *See*—
Sandered, Bror; Carlsson, Rune; and Andersson, Bengt, 4,447,013, Cl. 242-54.00R.
Carlyle, Ian C.; Savage, David S.; and Sleigh, Thomas, to Akzo N.V. Mono- and bisquaternary ammonium derivatives of 2β,16β-di-amino-5α-androstane derivatives and pharmaceutical preparations containing same. 4,447,425, Cl. 424-241.000.
Carruthers, Eben H., to Carruthers Equipment Co. Squid cleaning method and apparatus. 4,446,601, Cl. 17-51.000.
Carruthers Equipment Co.: *See*—
Carruthers, Eben H., 4,446,601, Cl. 17-51.000.
Carus Corporation: *See*—
Mein, Peter G., 4,447,406, Cl. 423-198.000.
Caskey, Terrence L.; Parker, Theodore L.; and Martin, Patrick H., to Dow Chemical Company, The. Method of preparing epoxy resins having low hydrolyzable chloride contents. 4,447,598, Cl. 528-489.000.

Cason, William C.: *See—*
Kuecker, Ward A.; Stratton, Susan D.; and Cason, William C., 4,447,888, Cl. 364-900.000.

Casperson, John R.; and Hann, Paul D., to Phillips Petroleum Company. Carbon black reactor with angled combustion chamber and non-aligned tangential hot gas entries for production of negative tint residual carbon black. 4,447,401, Cl. 422-151.000.

Cassella Aktiengesellschaft: *See—*
Muller, Rolf; and Wille, Herbert, 4,447,623, Cl. 549-36.000.

Cassonnet, Jean-Claude: *See—*
Bradley, John J.; Franklin, Benjamin S.; Slosberg, David M.; Appell, Marc; Cassonnet, Jean-Claude; and De Sabatier, Philippe D., 4,447,874, Cl. 364-200.000.

Castillo, Carmen: *See—*
Hayes, John C.; and Castillo, Carmen, 4,447,552, Cl. 502-41.000.

Castonguay, Roger N., to General Electric Company. Isolation shields for a 2500-4000 amp circuit breaker compartment. 4,447,682, Cl. 200-50.0AA.

Cataldo, Roy S., to General Motors Corporation. Internal combustion engine method for delayed reaction stratified combustion. 4,446,821, Cl. 123-26.000.

Caterpillar Tractor Co.: *See—*
Merritt, Paul H.; and Fuller, Francis W., 4,446,607, Cl. 29-33.00E.
Winzeler, James E.; and Windish, Willis E., 4,446,758, Cl. 74-781.00R.

CCT Associates: *See—*
Kaye, Gordon E.; Schwartz, Eugene B.; and Sollins, Irving V., 4,447,223, Cl. 604-61.000.

Celanese Corporation: *See—*
Shimp, David A., 4,447,586, Cl. 525-504.000.

Celaya, Emparanza Y Galdos S.A. (Cegasa): *See—*
Larranaga, Javier A., 4,447,507, Cl. 429-54.000.

Cemedine Co., Ltd.: *See—*
Takagi, Yasuo; and Horibe, Michiharu, 4,447,579, Cl. 525-113.000.

Centofanti, Joan G.: *See—*
Monte, Alex A.; and Centofanti, Joan G., 4,447,527, Cl. 435-7.000.

Centre National de la Recherche Scientifique: *See—*
Heindl, Rudolf; and Robert, Andre, 4,447,305, Cl. 204-192.00C.

Cerberus AG: *See—*
Bukowiecki, Stanislaw; and Paglotke, Karlheinz, 4,446,718, Cl. 73-23.000.
Mudge, Philip H.; and Kahl, William G., Jr., 4,447,726, Cl. 250-342.000.

Cerefice, Steven A.: *See—*
Donohue, John A.; Knobloch, James O.; Petty-Weeks, Bruce; and Cerefice, Steven A., 4,447,645, Cl. 562-473.000.

Champion International Corporation: *See—*
Cruse, Aubrey R., 4,447,296, Cl. 162-312.000.

Champion Spark Plug Italiana, S.p.A.: *See—*
Maiocco, Giuseppe A., 4,446,589, Cl. 15-250.320.

Chao, Tai-Hsiang, to UOP Inc. Preparation of alumina hydrosol from aluminum sulfate solution. 4,447,351, Cl. 252-313.00R.

Chap, John P., to Selfix, Inc. Peripheral decorative article. 4,446,642, Cl. 40-152.100.

Chapman, Leslie J., to Keith Hancock Structures Limited. Load support arrangement. 4,447,029, Cl. 248-246.000.

Chappell, Charles W.; and Spletzer, Eldon G., to Procter & Gamble Company, The. Process for making filled articles from polymeric material. 4,447,373, Cl. 264-4.000.

Charles Stark Draper Laboratory, Inc., The: *See—*
Boyce, Arthur J.; and Gold, David, 4,447,752, Cl. 310-232.000.

Chattin, Jesse R. Pedal telescoping device. 4,446,754, Cl. 74-594.300.

Chavand, Jean: *See—*
Brochier, Michel; and Chavand, Jean, 4,447,694, Cl. 219-68.000.

Chekroun, Claude D.; and Michel, Yves C., to Societe d'Etude du Radant. Lens for electronic scanning in the polarization plane. 4,447,815, Cl. 343-754.000.

Chemical Research & Licensing Company: *See—*
Smith, Lawrence A., Jr.; Jones, Edward M., Jr.; and Hearn, Dennis, 4,447,668, Cl. 585-639.000.

Chemie Linz AG: *See—*
Stern, Gerhard; and Weinrotter, Klaus, 4,447,568, Cl. 524-101.000.

Chemiefaser Lenzing AG: *See—*
Stern, Gerhard; and Weinrotter, Klaus, 4,447,568, Cl. 524-101.000.

Chemische Werke Huels AG: *See—*
Horlbeck, Gernot; and Feldmann, Rainer, 4,447,573, Cl. 524-394.000.

Chemische Werke Huels Aktiengesellschaft: *See—*
Mueller, Dieter J.; Fricke, Hermann; and Spielbrink, Heinrich, 4,447,273, Cl. 148-6.15R.

Chesney, Joseph J., Jr.; and Broney, Scott C., to Tile Council of America, Inc. Dry set grout. 4,447,267, Cl. 106-93.000.

Chevillat, Pierre R.; and Ungerboeck, Gottfried, to International Business Machines Corporation. Method of transmitting binary data sequences and arrangement for enabling the rapid determination of the end of a transmitted binary data sequence. 4,447,908, Cl. 375-42.000.

Chevron Research Company: *See—*
Buss, Waldeen C., 4,447,316, Cl. 208-138.000.
Ho, Andrew W., 4,447,450, Cl. 424-304.000.

Chiba, Toshiyuki: *See—*
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,447,430, Cl. 424-246.000.

Chicago Lock Co.: *See—*
Steinbach, Robert L., 4,446,709, Cl. 70-363.000.

Chikamura, Takao: *See—*
Ogawa, Kazufumi; Chikamura, Takao; and Shibata, Takuo, 4,447,720, Cl. 250-211.00J.

Chin, Aland K.; DiGiuseppe, Michael A.; and Temkin, Henryk, to Bell Telephone Laboratories, Incorporated. Light emitting diode. 4,447,822, Cl. 357-17.000.

Chobanov, Tsvetko; Kunze, Dieter; and Woeffler, Friedrich, to Varta Batterie Aktiengesellschaft. Manufacture of electrochemical high temperature cells. 4,447,376, Cl. 264-42.000.

Chore-Time Equipment, Inc.: *See—*
Rigterink, Preston D., 4,446,818, Cl. 119-52.0AF.

Chou, Chun-Chao: *See—*
Pence, Dallas T.; and Chou, Chun-Chao, 4,447,353, Cl. 252-630.000.

Christ-Janer, Victor F. Structural member suitable for use as a joist, beam, girder or the like. 4,446,668, Cl. 52-729.000.

Christe, Karl O.; and Wilson, William W., to United States of America, Navy. Perfluoroammonium salts fluoroxenon anions. 4,447,407, Cl. 423-262.000.

Christensen, Burton G.: *See—*
Firestone, Raymond A.; Cama, Lovji D.; and Christensen, Burton G., 4,447,602, Cl. 544-21.000.

Christensen, Per B.: *See—*
Dantzer-Sorensen, Bendt; and Christensen, Per B., 4,446,597, Cl. 16-364.000.

Christensson, Erik G.: *See—*
Bjork, Anders K. K.; Olsson, Knut G.; Abramo, Aina L.; and Christensson, Erik G., 4,447,433, Cl. 424-250.000.

Christiansen, Uwe; Rau, Karlheinz; Steinkohl, Anton; and Streb, Bruno, to Heraeus Quarzschmelze GmbH. Light-weight mirror blank for astronomical purposes and method of making a supporting framework for such blanks. 4,447,130, Cl. 350-310.000.

Christopherson, Kjell H. I.: *See—*
Riede, Gerhard; and Christopherson, Kjell H. I., 4,447,326, Cl. 210-321.300.

Chronis, George C. Portion control dressing and food dispenser. 4,446,988, Cl. 222-63.000.

Chugai Ro Co., Ltd.: *See—*
Maeda, Yasunori; and Yamasaki, Akinobu, 4,447,010, Cl. 239-414.000.

Chugai Seiyaku Kabushiki Kaisha: *See—*
Tanemura, Mitsura; Yamazaki, Tamotsu; Mizuno, Koji; Kaiho, Shin-ichi; Kakimoto, Morio; Hoshino, Eiichi; Matsunaga, Isao; and Hata, Shun-ichi, 4,447,453, Cl. 424-319.000.

Ciba-Geigy Corporation: *See—*
Aeschlimann, Peter, 4,447,359, Cl. 260-207.000.
Dexter, Martin; and Winter, Roland A. E., 4,447,511, Cl. 430-15.000.
Gosteli, Jacques; Ernest, Ivan; and Woodward, Robert B., 4,447,360, Cl. 260-239.00A.
Holzle, Gerd; and Begrich, Rainer, 4,447,357, Cl. 260-153.000.
Kunz, Walter, 4,447,625, Cl. 549-265.000.
Sallmann, Alfred, 4,447,431, Cl. 424-246.000.
Schwander, Hansrudolf; and Furrer, Peter, 4,447,358, Cl. 260-205.000.

Cipelletti, Alberto, to Frigomat S.a.s. di Alberto Cipelletti & C. Pasteurization system with heat recovery. 4,446,778, Cl. 99-455.000.

Claas OHG: *See—*
Jennen, Wolfgang; and Sprugel, Gerd, 4,446,682, Cl. 56-119.000.

Claiborne, J. Lyle, to Dixie Yarns, Inc. Odor scavenging system. 4,447,243, Cl. 8-188.000.

Clairol Incorporated: *See—*
Bullock, James H., 4,447,705, Cl. 219-222.000.

Clapper, Robert L.: *See—*
Hankosky, Andrew; and Clapper, Robert L., 4,447,036, Cl. 251-63.400.

Clark, James W.: *See—*
Bradley, Kirk D.; Koski, Robert R.; and Clark, James W., 4,447,072, Cl. 280-492.000.

Clark, John E.: *See—*
Dupuy, Ronald E.; and Clark, John E., 4,447,065, Cl. 277-184.000.

Clark, Norman O., to English Clays Lovering Pochin & Co. Ltd. Pressure filters. 4,447,327, Cl. 210-350.000.

Clark, R. Donald, to Eastman Kodak Company. Process for the preparation of 2-amino-6-nitrobenzothiazole. 4,447,617, Cl. 548-164.000.

Clarke, John M., to Clarke, John M. Thoracentesis device. 4,447,235, Cl. 604-169.000.

Clean-Tex A/S: *See—*
Knudsen, Poul H., 4,447,201, Cl. 425-397.000.

Clelland, John P.: *See—*
Renfro, Vernon E.; Gudgeon, Ronald L.; Clelland, John P.; and Cole, Clyde C., 4,447,186, Cl. 414-589.000.

Clement, Carl P.: *See—*
Schwartz, Henry D.; Krull, Irwin H.; Clement, Carl P.; Stengel, Frederick H.; and Hayslett, David D., 4,447,398, Cl. 422-102.000.

Clement, Warren J., to Sprague Electric Company. Capacitor assembly. 4,447,852, Cl. 361-306.000.

Clevett, Merton L.; and Clevett, Mildred L. Solar oven. 4,446,854, Cl. 126-451.000.

Clevett, Mildred L.: *See—*
Clevett, Merton L.; and Clevett, Mildred L., 4,446,854, Cl. 126-451.000.

Clinefelter, Richard L.; and Bradford, Larry R., to Gates Rubber Company, The. Non-pneumatic tire. 4,446,903, Cl. 152-323.000.

Clingman, William H.; and Hall, Kenneth R., to Precision Machine Products, Inc. Proportional flow sampler. 4,446,748, Cl. 73-863.030.

Clini-Therm Corporation: *See*—
Vaguine, Victor A., 4,446,874, Cl. 128-804.000.

Close, Donald, to David Hudson, Inc. Novel fluoroelastomer film compositions and method for the preparation thereof. 4,447,478, Cl. 427-407.100.

Cluett, Peabody & Co., Inc.: *See*—
Lawrence, Jackson; Webb, Harry A.; and Frederick, John R., 4,446,606, Cl. 26-18.600.

Cluff, Coran L.: *See*—
Jessen, Reed J.; Thorne, James M.; Cluff, Coran L.; and Hayes, John K., 4,447,303, Cl. 204-157.10R.

Coeffic, Jean-Pierre, to Deere & Company. Rake wheel attachment. 4,446,685, Cl. 56-377.000.

Coelho, Gregorio J.: *See*—
Karubian, Ralph K.; and Coelho, Gregorio J., 4,446,599, Cl. 17-1.00B.

Coenen, Hubert; and Kriegel, Ernst, to FRIED. Krupp Gesellschaft mit beschrankter Haftung. Method for underground gasification of solid fuels. 4,446,921, Cl. 166-267.000.

Cogswell, Frederic N.; and Tomka, Jiri G., to Imperial Chemical Industries PLC. Thermotropic liquid crystal shaped article. 4,447,599, Cl. 528-502.000.

Cohen, Leonard G., to Bell Telephone Laboratories, Incorporated. Multimode optical fiber with radially varying attenuation center density. 4,447,124, Cl. 350-96.300.

Cohen, Leonard G.; Mammel, Wanda L.; and Marcuse, Dietrich, to Bell Telephone Laboratories, Incorporated. Low loss single mode fiber. 4,447,127, Cl. 350-96.330.

Cohen, Robert K., to General Electric Company. Resistance spot welder adaptive control. 4,447,700, Cl. 219-117.100.

Cohen, Saul M.; and LeBlanc, John R., to Monsanto Company. Heat-curable compositions comprising isocyanuric acid-acrolein derivatives. 4,447,594, Cl. 528-245.000.

Coker, Lowell E.; and Venkatasubramanian, Kalyanasundram, to H. J. Heinz Company. Process for the manufacture of low D.E. maltodextrins. 4,447,532, Cl. 435-99.000.

Cole, Clyde C.: *See*—
Renfro, Vernon E.; Gudgeon, Ronald L.; Clelland, John P.; and Cole, Clyde C., 4,447,186, Cl. 414-589.000.

Colin, Jean P., to Ateliers et Chantiers de Bretagne A.C.B. Barge-tug connection apparatus. 4,446,808, Cl. 114-248.000.

Collington, Eric W.; Finch, Harry; and Newton, Roger F., to Glaxo Group Limited. Prostanoid compounds and pharmaceutical compositions. 4,447,428, Cl. 424-244.000.

Columbia Industries Corporation: *See*—
Hahn, Linus K., 4,446,846, Cl. 126-25.00R.

Combustion Engineering, Inc.: *See*—
Andersen, Mark S., 4,446,799, Cl. 110-263.000.

Cominco Ltd.: *See*—
Willans, Robert D. H., 4,447,308, Cl. 204-279.000.

Commander Electrical Materials, Inc.: *See*—
Nattel, William, 4,447,030, Cl. 248-27.100.

Commissariat a l'Energie Atomique: *See*—
Bedu, Marcel; and Jeanjean, Marcel, 4,447,766, Cl. 315-241.00R.
Brochier, Michel; and Chavand, Jean, 4,447,694, Cl. 219-68.000.
Heindl, Rudolf; and Robert, Andre, 4,447,305, Cl. 204-192.00C.

Commonwealth Scientific and Industries Research Organization: *See*—
Lubbock, Frederick J.; Mok, Christopher C. K.; and Eldridge, Robert J., 4,447,475, Cl. 427-213.310.

Compagnie Francaise des Petroles: *See*—
Fey, Jean-Jacques, 4,447,340, Cl. 252-8.50C.

Compagnie General d'Electricite: *See*—
Pugliese, Vincent; and Farcy, Jean-Claude, 4,447,789, Cl. 330-4.300.

Compagnie Generale des Etablissements Michelin: *See*—
Madec, Francois; Delobelle, Emile; and Donvez, Georges, 4,446,902, Cl. 152-209.00B.

Compagnie Honeywell Bull: *See*—
Bradley, John J.; Franklin, Benjamin S.; Slosberg, David M.; Appell, Marc; Cassonnet, Jean-Claude; and De Sabatier, Philippe D., 4,447,874, Cl. 364-200.000.

Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme): *See*—
Desserre, Jacques; and Helle, Michel, 4,447,839, Cl. 360-113.000.

Compagnoni, Felice. System to uniformly fill cases with fruit and vegetables. 4,446,670, Cl. 53-244.000.

Compo Industries, Inc.: *See*—
Slosberg, David K.; and Nowell, Gilbert S., 4,447,484, Cl. 428-137.000.

Conax Corporation: *See*—
Jankowiak, Roman; and Connell, Maurice W., 4,447,084, Cl. 294-83.0AE.

Connei S.p.A.: *See*—
Ghigliotti, Giovanni; and Lancella, Attilio, 4,447,108, Cl. 339-256.0RT.

Connell, James J.: *See*—
Minnick, Michael G.; Connell, James J.; and McGregor, Charles W., 4,447,472, Cl. 427-120.000.

Connell, Maurice W.: *See*—
Jankowiak, Roman; and Connell, Maurice W., 4,447,084, Cl. 294-83.0AE.

Connolly, Ronald G.: *See*—
Perkins, Ezra C.; and Connolly, Ronald G., 4,446,578, Cl. 3-1.910.

Container Corporation of America: *See*—
House, Richard F.; and Kohler, Karl A., 4,447,004, Cl. 229-52.00B.

Continental Disc Corporation: *See*—
Paul, Herman L., Jr., 4,446,883, Cl. 137-315.000.

Continental Packaging Company, Inc.: *See*—
Roth, Donald J.; Walter, John; and Kubis, Charles S., 4,446,984, Cl. 220-268.000.

Contraves AG: *See*—
Heller, Rudolf; and Kahn, Iwan, 4,446,792, Cl. 102-473.000.

Control Data Corporation: *See*—
Berg, William C., 4,447,842, Cl. 361-386.000.

Control Resources Corporation: *See*—
O'Pray, Bruce L., 4,447,813, Cl. 340-825.100.

Conver Corporation: *See*—
Reeves, Charles R., 4,447,866, Cl. 363-21.000.

Cook, Gerald R.; Iacoviello, John G.; Pinschmidt, Robert K., Jr.; and Davidowich, George, to Air Products and Chemicals, Inc. Binder compositions for making nonwoven fabrics having good hydrophobic rewet properties. 4,447,570, Cl. 524-127.000.

Cooper Industries, Inc.: *See*—
Sievers, Henry T., 4,446,764, Cl. 81-170.000.

Cooper, Larry V.; and Sloane, Michael W., Sr., to Ace Fishing & Rental Tools, Inc. Retrievable float valve assembly. 4,446,610, Cl. 29-421.00E.

Cooper, Ronald F.; and Johnson, Erlon F., to AMP Incorporated. Connector for fiber optic member. 4,447,121, Cl. 350-96.200.

Copal Company Limited: *See*—
Suzuki, Akira; Kaneko, Katumi; and Inoue, Nobuyoshi, 4,447,142, Cl. 354-246.000.

Copeman, Richard C.: *See*—
Hughes, Alan C.; Copeman, Richard C.; and Marples, Thomas N. R., 4,447,254, Cl. 71-67.000.

Copolymer Rubber & Chemical Corporation: *See*—
Gros, Harold J., 4,447,582, Cl. 525-279.000.

Cordis Corporation: *See*—
Quinn, David R., 4,447,236, Cl. 604-169.000.

Corney, John M., to Elliott Brothers (London) Limited. Redundant actuation system. 4,447,769, Cl. 318-564.000.

Corning Glass Works: *See*—
Ellis, James E.; Lidgard, Graham P.; Odstrchel, Gerald; and Riceberg, Louis J., 4,447,528, Cl. 435-7.000.
Leroy, Dominique L. J.; and Mazeau, Jean-Pierre, 4,447,550, Cl. 501-75.000.

Cornwell, Kenyon L.: *See*—
Schwartz, Charles A.; and Cornwell, Kenyon L., 4,447,464, Cl. 426-663.000.

Corse, Kenneth J. Multi-purpose baking utensil. 4,446,982, Cl. 220-8.000.

Cory, John C.: *See*—
Yunker, Conrad E.; Cory, John C.; and Meibos, Harold R., 4,447,537, Cl. 435-235.000.

Cosaert, Marijke, to Linesir. Alterable frame and small fastening block for assembling such a frame. 4,446,641, Cl. 40-152.000.

Costerousse, Germain: *See*—
Teutsch, Jean G.; Costerousse, Germain; Philibert, Daniel; and Deraedt, Roger, 4,447,424, Cl. 424-238.000.

Cote, Paul T., to General Electric Company. Power supply for low voltage incandescent lamp. 4,447,765, Cl. 315-240.000.

Cote, Paul T.: *See*—
Kornrumpf, William P.; and Cote, Paul T., 4,447,764, Cl. 315-240.000.

Council of Scientific and Industrial Research Rafi Marg: *See*—
Salman, Mohammad; Ray, Suprabhat; Kamboj, Ved P.; and Anand, Nitya, 4,447,622, Cl. 548-525.000.

Coursant, Roger-Henri, to U.S. Philips Corporation. Echo ultrasound examination device with multi-layer transducer. 4,446,739, Cl. 73-609.000.

Covillion, Joseph E. Heating system. 4,447,712, Cl. 219-486.000.

Cox, G. Robert, to Devine Manufacturing Company. Autoclaves. 4,447,402, Cl. 422-174.000.

Crawley, John A., to Cambridge Instruments Limited. Apparatus for vapor deposition of a film on a substrate. 4,446,817, Cl. 118-725.000.

Cremers, David A.; and Keller, Richard A., to United States of America, Energy. Apparatus and method for quantitative measurement of small differences in optical absorptivity between two samples using differential interferometry and the thermooptic effect. 4,447,153, Cl. 356-361.000.

Crisman, Robert W.; and DeAngelis, Dominick, to Mobil Oil Corporation. Fuel sludge treatment method, especially for leaded gasoline storage tank sludge. 4,447,332, Cl. 210-748.000.

Cronin, Michael J., to Lockheed Corporation. Variable frequency induction generator. 4,447,737, Cl. 290-6.000.

Crosby, Philip S.; and Jordan, Dale A., to Tektronix, Inc. Offset digital dither generator. 4,447,803, Cl. 340-347.0CC.

Crouse-Hinds Company: *See*—
Smith, Donald C.; Snow, Richard F.; and Pauli, George B., 4,447,864, Cl. 362-311.000.

Cruse, Aubrey R., to Champion International Corporation. Double nip hydrofoil. 4,447,296, Cl. 162-312.000.

Crutcher Resources Corporation: *See*—
Wheeler, Lionel H.; and Goekler, Robert G., 4,446,713, Cl. 72-308.000.

Cruz, Lourdes J.: *See*—
Olivera, Baldomero M.; Cruz, Lourdes J.; Gray, William R.; and Rivier, Jean E. F., 4,447,356, Cl. 260-112.50R.

Csongor, Desider G., to Northern Lights Trust. Modular mixing apparatus including interchangeable fluid processing means. 4,447,156, Cl. 366-80.000.

Culley, Bobby G., to Texas Instruments Incorporated. Electronic learning aid. 4,447,213, Cl. 434-201.000.

Cunard, Joel C.; and Ziegler, William H., Jr., to Brown Group Recreational Products, Inc. Wheel. 4,447,093, Cl. 301-63.0PW.

Custom Oilfield Products, Inc.: *See—*
Redmon, Billy L.; and Forester, Buford G., 4,446,887, Cl. 137-556.000.

Cutter Laboratories, Inc.: *See—*
Gay, John C.; McCurdy, H. Dennis; and Rose, Wayne B., 4,447,414, Cl. 424-81.000.

Cvacho, Daniel S. Methods of necking-in and flanging tubular can bodies. 4,446,714, Cl. 72-370.000.

Czajkowski, Norman. Putting practice device with spiral track. 4,447,059, Cl. 273-176.0FA.

Czech, Franz; and Subotic, Miroslav, to BBC Brown, Boveri & Company, Limited. Funnel-shaped support insulator and a high-voltage arrangement using the support insulator. 4,447,671, Cl. 174-28.000.

Dabi, Shmuel; and Loewrigkeit, Peter, to Witco Chemical Corporation. Stabilization of polyurethanes. 4,447,571, Cl. 524-192.000.

Dacor Corporation: *See—*
Pedersen, Vernon G., 4,446,859, Cl. 128-204.260.

Dage, Richard C.: *See—*
Grisar, J. Martin; Schnettler, Richard A.; and Dage, Richard C., 4,447,619, Cl. 548-318.000.

Dahl, Hans: *See—*
Bubik, Alfred; Dahl, Hans; Holik, Herbert; Kurtz, Rudiger; and Seider, Werner, 4,447,295, Cl. 162-300.000.

Dahm, Franz-Ludwig: *See—*
Beschke, Helmut; Dahm, Franz-Ludwig; Friedrich, Heinz; and Prescher, Gunter, 4,447,614, Cl. 546-316.000.
Beschke, Helmut; Dahm, Franz-Ludwig; Friedrich, Heinz; and Prescher, Gunter, 4,447,615, Cl. 546-317.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Inada, Junji, 4,446,674, Cl. 53-502.000.

Daicel Chemical Industries, Ltd.: *See—*
Watanabe, Shoji; and Miho, Takuya, 4,447,591, Cl. 528-80.000.

Daikin Kogyo Co., Ltd.: *See—*
Akiyama, Toru; Kamihigoshi, Tsutomu; Takagi, Shoji; and Maeda, Tadayuki, 4,447,663, Cl. 570-150.000.

Dainippon Pharmaceutical Co., Ltd.: *See—*
Nishimura, Haruki; Naruto, Shunsuke; Mizuta, Hiroyuki; Kadokawa, Toshiaki; and Kawashima, Katsuyoshi, 4,447,439, Cl. 424-267.000.
Sakamoto, Hajimu; Kiyota, Takao; and Hayashi, Hiroshi, 4,447,355, Cl. 260-112.00B.

Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Sano, Tetsuo; and Sakamoto, Takashi, 4,447,833, Cl. 358-298.000.
Ueda, Sadao; Tokura, Isao; and Yamada, Mitsuhiko, 4,447,113, Cl. 358-75.000.

Dairyland Food Laboratories: *See—*
Moskowitz, Gerard J., 4,447,536, Cl. 435-188.000.

d'Alayer de Costemore d'Arc, Stephane M. A.: *See—*
Schatteman, Etienne A.; and d'Alayer de Costemore d'Arc, Stephane M. A., 4,447,900, Cl. 369-200.000.

D'Alessandro, Thomas C. Battery powered lawn edger. 4,446,680, Cl. 56-11.900.

Dalrymple, Thomas H., to Dresser Industries, Inc. Cross-pit conveyor. 4,446,958, Cl. 198-311.000.

Dalton, Tom E. Football training apparatus. 4,447,056, Cl. 273-55.00R.

Dalzell, Rex J.: *See—*
Tiers, George V. D.; Aasen, Steven M.; Dalzell, Rex J.; and Holmes, Brian N., 4,447,521, Cl. 430-337.000.

D'Amico, John J., to Monsanto Company. N-Substituted thioxobenzothiazolines. 4,447,618, Cl. 548-170.000.

Damon Corporation: *See—*
Dohse, Jerry L.; and Hess, Peter A., 4,446,957, Cl. 194-54.000.

Danfoss A/S: *See—*
Eder, Werner; and Fischer, Gisbert, 4,447,706, Cl. 219-299.000.

Danly Machine Corporation: *See—*
Tack, Carl E., Jr., 4,446,785, Cl. 100-35.000.

Dannels, W. Andrew; and Bainbridge, Robert W., to Occidental Chemical Corporation. Process for runnerless injection - compression molding of thermosetting materials. 4,447,386, Cl. 264-328.200.

Dantzer-Sorensen, Bendt; and Christensen, Per B., to V. Kann Rasmussen Holding A/S. Hinge device for inclined tilting type windows with external cover rails. 4,446,597, Cl. 16-364.000.

Dardi, Louis E.; and Shankar, Srinivasan, to Howmet Turbine Components Corporation. Superalloy coating composition with high temperature oxidation resistance. 4,447,503, Cl. 428-632.000.

Dash, John: *See—*
Kasaaian, Arash S.; and Dash, John, 4,447,299, Cl. 204-43.00R.

Data General Corporation: *See—*
Fong, Anthony S., 4,447,879, Cl. 364-200.000.
Grondalski, David, 4,447,877, Cl. 364-200.000.

David Hudson, Inc.: *See—*
Close, Donald, 4,447,478, Cl. 427-407.100.

Davidowich, George: *See—*
Cook, Gerald R.; Iacoviello, John G.; Pinschmidt, Robert K., Jr.; and Davidowich, George, 4,447,570, Cl. 524-127.000.

Davies, Graham J.; Heckingbottom, Roger; and Andrews, David A., to Post Office, The. Molecular beam epitaxy electrolytic dopant source. 4,447,276, Cl. 148-175.000.

Davies, Leslie J.: *See—*
Baum, Eric A.; Davies, Leslie J.; Kirk, William F.; and Wass, Anthony C. L., 4,446,862, Cl. 128-203.150.

Davies, Roy V., to Boots Company PLC, The. 3-Methylsulfonylmethyl-4-quinolinones useful for treating hypertension. 4,447,435, Cl. 424-258.000.

Davis, Alan L.: *See—*
Punako, Stephen; Davis, Alan L.; and Eifler, Raymond J., 4,447,110, Cl. 339-262.0RR.

Davis, Arthur M.; and Pollington, Warren J., to Williams International Corporation. Cooled turbine wheel. 4,447,188, Cl. 415-115.000.

Davis, Douglas D. Herbicide applicator. 4,446,650, Cl. 47-1.500.

Davis, Glenn R. Hospital shorts. 4,446,575, Cl. 2-400.000.

Davis, Larry A.; Boyce, Gregory H.; Mulloy, Timothy P.; Nebeker, Neil J.; Newman, Elmer C.; Quinn, Donald J.; and Adamson, David L. Electrowinning cell having partially shielded anodes. 4,447,307, Cl. 204-267.000.

Davis, Lois T.: *See—*
Pillis, Lewis J.; and Davis, Lois T., 4,447,539, Cl. 435-253.000.

Davison, John A., to Warner-Lambert Company. Microsurgical needle holder. 4,446,866, Cl. 128-340.000.

Day, Richard B.: *See—*
Campana, Jerry M.; and Day, Richard B., 4,447,083, Cl. 294-66.00R.

Dean, David F. Adjustable tool for tub overflow. 4,446,583, Cl. 4-206.000.

DeAngelis, Dominick: *See—*
Crisman, Robert W.; and DeAngelis, Dominick, 4,447,332, Cl. 210-748.000.

DeCant, Leonard J., Jr.; Idriss, Samir F.; and Prosl, Frank R., to Infusaid Corporation. Variable flow implantable infusion apparatus. 4,447,224, Cl. 604-67.000.

Deere & Company: *See—*
Coeffic, Jean-Pierre, 4,446,685, Cl. 56-377.000.
Frimml, Roger W.; and Meiers, Gerald F., 4,446,684, Cl. 56-341.000.
Hockenberry, Richard L., 4,446,726, Cl. 73-61.400.
Illy, Pierre, 4,446,783, Cl. 100-5.000.

DeFazio, Sally R.; Gozzo, James J.; and Monaco, Anthony P., to New England Deaconess Hospital. Bladder cancer detection. 4,447,545, Cl. 436-518.000.

Degussa Aktiengesellschaft: *See—*
Beschke, Helmut; Friedrich, Heinz; and Heilos, Johannes, 4,447,612, Cl. 546-285.000.
Beschke, Helmut; Dahm, Franz-Ludwig; Friedrich, Heinz; and Prescher, Gunter, 4,447,614, Cl. 546-316.000.
Beschke, Helmut; Dahm, Franz-Ludwig; Friedrich, Heinz; and Prescher, Gunter, 4,447,615, Cl. 546-317.000.

Deibig, Heinrich; and Wollmann, Klaus, to Battelle-Institut e.V. Method for the production of corrosion-inhibiting coatings on metallic surfaces. 4,447,477, Cl. 427-388.300.

Deleu, Walter V., to Sperry Corporation. Stone trap for combine harvesters. 4,446,875, Cl. 130-27.0JT.

Delle Donne, Nicola: *See—*
Di Nocco, Dino; and Delle Donne, Nicola, 4,447,252, Cl. 65-268.000.

Delobelle, Emile: *See—*
Madec, Francois; Delobelle, Emile; and Donvez, Georges, 4,446,902, Cl. 152-209.00B.

DeLong, Ronald V., to Motorola Inc. Temperature stable pulse counting FM detector. 4,447,772, Cl. 329-126.000.

del Soldato, Piero: *See—*
Trummlitz, Gunter; Engel, Wolfhard; Eberlein, Wolfgang; Schmidt, Gunther; Hammer, Rudolf; and del Soldato, Piero, 4,447,434, Cl. 424-256.000.

Denham, Daniel W. Saw blade clamp. 4,446,760, Cl. 76-79.000.

Denk, Heimo; Mantsch, Peter; and Moser, Werner, to List, Hans. Device for generating an electric trigger pulse. 4,447,742, Cl. 307-106.000.

Dennis, Robert P., to General Motors Corporation. Adjustable lens for a transmission ratio indicator. 4,446,809, Cl. 116-28.100.

Denton, Donald W., to State Industries, Inc. Method of insulating the exterior of a water heater tank. 4,447,377, Cl. 264-45.200.

den Toonder, Pieter, to Oak Industries Inc. Phase change dynamic scrambling. 4,447,828, Cl. 358-118.000.

Deraedt, Roger: *See—*
Teutsch, Jean G.; Costerousse, Germain; Philibert, Daniel; and Deraedt, Roger, 4,447,424, Cl. 424-238.000.

Derbyshire, Francis J.; and Whitehurst, Darrell D., to Mobil Oil Corporation. Production of distillates by the integration of supercritical extraction and gasification through methanol to gasoline. 4,447,310, Cl. 208-8.0LE.

De Sabatier, Philippe D.: *See—*
Bradley, John J.; Franklin, Benjamin S.; Slosberg, David M.; Appell, Marc; Cassonnet, Jean-Claude; and De Sabatier, Philippe D., 4,447,874, Cl. 364-200.000.

Design Professionals Financial Corporation: *See—*
Okubo, Shigeo, 4,446,733, Cl. 73-579.000.

Desmarais, Mark R., to AMP Incorporated. Switch key assembly having improved switch actuation. 4,447,681, Cl. 200-5.00A.

Despot, Janko: *See—*
Abendroth, Paul; and Despot, Janko, 4,446,814, Cl. 118-694.000.

Desserre, Jacques; and Helle, Michel, to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme). Magnetoresistant transducer. 4,447,839, Cl. 360-113.000.

Desthieux, Johannes. Bottle-filling method and device. 4,446,673, Cl. 53-467.000.

Detroit, William J., to Reed Lignin, Inc. Oil well drilling clay conditioners and method of their preparation. 4,447,339, Cl. 252-8.50A.

Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Combination tone generator for a musical instrument. 4,446,769, Cl. 84-1.010.

Devel Corporation: *See*—
Kelsey, Charles C., Jr.; and Wolff, Walter C., 4,446,645, Cl. 42-50.000.

Devine Manufacturing Company: *See*—
Cox, G. Robert, 4,447,402, Cl. 422-174.000.

Dexter, Martin; and Winter, Roland A. E., to Ciba-Geigy Corporation. 2-[2-Hydroxy-3,5-di-tert-octylphenyl]-2H-benzotriazole in stabilized photographic compositions. 4,447,511, Cl. 430-15.000.

de Zwart, Maarten, to U.S. Philips Corporation. Liquid crystal display device. 4,447,132, Cl. 350-346.000.

Dhein, Rolf: *See*—
Hocker, Jurgen; Dhein, Rolf; and Merten, Rudolf, 4,447,583, Cl. 525-328.100.

Di-Dro Systems Inc.: *See*—
Newell, James M., 4,447,047, Cl. 267-118.000.

Diagnostic Information, Inc.: *See*—
Wang, Shih-Ping, 4,447,721, Cl. 250-213.0VT.

Diamond Shamrock Chemicals Company: *See*—
Nachfolger, Solomon J., 4,447,266, Cl. 106-90.000.

Dick, David A.: *See*—
Reed, Leonard W.; Barr, Robert M. S.; and Dick, David A., 4,447,199, Cl. 425-182.000.

Dickore, Karlfried; Sasse, Klaus; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. 3-Dimethylamino-4-methyl-1,2,4-triazin-5(4H)-ones and herbicidal compositions. 4,447,258, Cl. 71-93.000.

Dickore, Karlfried; and Kuhle, Engelbert, to Bayer Aktiengesellschaft. N-Substituted imido-dicarboxylic acid diaryl ester compounds and herbicide intermediates. 4,447,635, Cl. 560-115.000.

Dickson, Kenneth A. Closure for containers. 4,446,985, Cl. 220-269.000.

Didier Engineering GmbH.: *See*—
Wagener, Dietrich; Sander, Theo; and Laue, Karl H., 4,447,333, Cl. 210-750.000.

Die-Craft Metal Products, Inc.: *See*—
Hofbauer, John, 4,447,287, Cl. 156-552.000.

Diedrich, Bernd: *See*—
Berthold, Joachim; Diedrich, Bernd; Franke, Rainer; Hartlapp, Jurgen; Schafer, Werner; and Strobel, Wolfgang, 4,447,587, Cl. 526-124.000.

Dietrich, William J., Sr., to DMI, Inc. High speed tillage system with discs and plow points. 4,446,924, Cl. 172-140.000.

Dietz, Peter W.: *See*—
Miller, Russell S.; Dietz, Peter W.; and Bray, Christopher, 4,446,910, Cl. 165-1.000.

DiGiuseppe, Michael A.: *See*—
Chin, Aland K.; DiGiuseppe, Michael A.; and Temkin, Henryk, 4,447,822, Cl. 357-17.000.

Diker, Charles M.: *See*—
Moe, Walter; and Diker, Charles M., 4,446,649, Cl. 46-218.000.

Dino, Mio: *See*—
Valerio, Savorgnan; and Dino, Mio, 4,447,282, Cl. 156-285.000.

Di Nocco, Dino; and Delle Donne, Nicola, to Societa Italiana Vetro - SIV - S.p.A. Apparatus for curving and tempering or heat toughening thin glass sheets. 4,447,252, Cl. 65-268.000.

Dionne, John B.: *See*—
Lamphere, William R., 4,446,622, Cl. 30-272.00R.

Diploma, Eduardo P.: *See*—
Gurak, Ronald W.; and Diploma, Eduardo P., 4,446,784, Cl. 100-27.000.

Disselnkotter, Hans: *See*—
Oediger, Hermann; Lieb, Folker; and Disselnkotter, Hans, 4,447,367, Cl. 260-502.40R.

Distin, Robert G., Jr.: *See*—
Shaffer, James E.; and Distin, Robert G., Jr., 4,446,752, Cl. 74-462.000.

Dixie Yarns, Inc.: *See*—
Claiborne, J. Lyle, 4,447,243, Cl. 8-188.000.

Dixon, Richard W.; Koszi, Louis A.; Miller, Richard C.; and Schwartz, Bertram, to Bell Telephone Laboratories, Incorporated. Current confinement in semiconductor light emitting devices. 4,447,905, Cl. 372-46.000.

DMI, Inc.: *See*—
Dietrich, William J., Sr., 4,446,924, Cl. 172-140.000.

Dobkin, Robert C., to National Semiconductor Corporation. Temperature compensated bandgap voltage reference circuit. 4,447,784, Cl. 323-226.000.

Dr. Eduard Fresenius Chemisch-Pharmazeutishe Industry KG: *See*—
Krutten, Victor, 4,447,239, Cl. 604-282.000.

Dr. Eugen Durrwachter Doduco KG: *See*—
Bollian, Erwin, 4,446,618, Cl. 29-882.000.

Dr. Karl Thomae GmbH: *See*—
Trummlitz, Gunter; Engel, Wolfhard; Eberlein, Wolfgang; Schmidt, Gunther; Hammer, Rudolf; and del Soldato, Piero, 4,447,434, Cl. 424-256.000.

Dodge, David L.: *See*—
Hooley, Eldon R.; and Dodge, David L., 4,446,600, Cl. 17-11.000.

Dohse, Jerry L.; and Hess, Peter A., to Damon Corporation. Coin operated article dispensing mechanism. 4,446,957, Cl. 194-54.000.

Domian, Robert E.: *See*—
Stevenson, David J.; and Domian, Robert E., 4,446,990, Cl. 222-82.000.

Domnanovich, James R.: *See*—
Groch, Mark W.; and Domnanovich, James R., 4,446,873, Cl. 128-715.000.

Donohue, John A.; Knobloch, James O.; Petty-Weeks, Bruce; and Cerefice, Steven A., to Standard Oil Company (Indiana). Process for purification of p-hydroxymethylbenzoic acid. 4,447,645, Cl. 562-473.000.

Donvez, Georges: *See*—
Madec, Francois; Delobelle, Emile; and Donvez, Georges, 4,446,902, Cl. 152-209.00B.

Dore, Alain: *See*—
Barthelat, Rene; and Dore, Alain, 4,447,129, Cl. 350-302.000.

Dornier, Peter, to Lindauer Dornier Gesellschaft mbH. Drying equipment for tubular textile wares. 4,446,632, Cl. 34-103.000.

Dorony, Elmer F.: *See*—
French, Robert J.; and Dorony, Elmer F., 4,447,099, Cl. 312-257.00R.

Doroszlai, Pal; and Ferroni, Ferruccio, to Elektrowatt Ingenieurunternehmung AG. Transport containers for radioactive material. 4,447,729, Cl. 250-506.100.

Dorsey, Robert J.: *See*—
Long, Gary R.; and Dorsey, Robert J., 4,447,198, Cl. 425-140.000.

Dow Chemical Company, The: *See*—
Caskey, Terrence L.; Parker, Theodore L.; and Martin, Patrick H., 4,447,598, Cl. 528-489.000.
Eickholt, Kathryn A., 4,447,640, Cl. 560-207.000.
Gerwick, Ben C., III, 4,447,257, Cl. 71-91.000.
Kershner, Larry D.; Thompson, Leonard R.; and Strom, Robert M., 4,447,656, Cl. 568-730.000.
Murchison, Craig B.; Stowe, Robert A.; and Weiss, Richard L., 4,447,664, Cl. 585-323.000.
Renga, James M., 4,447,650, Cl. 568-640.000.
White, William L.; and Anzeveno, Peter B., 4,447,636, Cl. 560-122.000.

Dow Corning Corporation: *See*—
Frisch, Eldon E.; and Parks, Leon C., 4,447,237, Cl. 604-175.000.
Swihart, Terence J.; and Ziemelis, Maris J., 4,447,499, Cl. 428-447.000.

Drake, Charles J.: *See*—
Van Sikle, Truman T.; and Drake, Charles J., 4,447,698, Cl. 219-110.000.

Dresser Industries, Inc.: *See*—
Dalrymple, Thomas H., 4,446,958, Cl. 198-311.000.
Pillow, Dan L., 4,446,929, Cl. 173-17.000.

Drewitz, Hans J.: *See*—
Hagin, Faust; and Drewitz, Hans J., 4,446,756, Cl. 74-687.000.

Drexler, Johann: *See*—
Harbauer, Werner; Drexler, Johann; and Flierl, Erwin, 4,447,794, Cl. 335-128.000.

Driscoll, William A.; Heilmann, Steven M.; and Rasmussen, Jerald K., to Minnesota Mining and Manufacturing Company. Vibration-damping constrained-layer constructions. 4,447,493, Cl. 428-332.000.

Drulard, Norman R. Portable lightning rod. 4,447,847, Cl. 361-117.000.

Drzewiecki, Paul J.: *See*—
Loos, Patricia J.; Fuqua, Debra L.; and Drzewiecki, Paul J., 4,447,461, Cl. 426-589.000.

Duffer, Paul F.: *See*—
Franz, Helmut; Duffer, Paul F.; and Kelly, Joseph D., 4,447,496, Cl. 428-432.000.

Dufresne, Gilles L.: *See*—
Unterhoffer, Peter P.; and Dufresne, Gilles L., 4,446,655, Cl. 49-368.000.

Dumont, Claude: *See*—
Ledelec, Lucien; Guillaume, Jacques; and Dumont, Claude, 4,447,438, Cl. 424-267.000.

Dunkel, Gerd: *See*—
Becker, Kunibert; Dunkel, Gerd; Lagodka, Gunter; and Kirchbrucher, Rudiger, 4,447,174, Cl. 405-293.000.

Dunlap, Clifford E., to North American Philips Corporation. Multiple rail linear feed system. 4,446,959, Cl. 198-382.000.

Dunn, Stanley A.; Pomplun, Alan R.; Paquette, Elmer G.; Ethridge, Edwin C.; and Johnson, Jerry. L., to United States of America, National Aeronautics and Space Administration. Sonic levitation apparatus. 4,447,251, Cl. 65-142.000.

Dunne, Maurice J.; and Nielsen, Klaus W., to Unimation, Inc. Weld gun repositioning system for programmable manipulator. 4,447,697, Cl. 219-86.410.

Duphar International Research B.V.: *See*—
Bekkering, Hendrik M., 4,447,231, Cl. 604-131.000.

Du Pont de Nemours, E. I., and Company: *See*—
Farnham, William B., 4,447,628, Cl. 556-415.000.
Hagan, Edward F.; and Reaver, Marvin G., Jr., 4,446,625, Cl. 33-184.500.
Harris, John F., Jr., 4,447,592, Cl. 528-128.000.
Houtz, Timothy W.; and Jagen, Paul R., 4,447,106, Cl. 339-126.00R.

Dupuy, Ronald E.; and Clark, John E., to General Tire & Rubber Company, The. Sealing strip. 4,447,065, Cl. 277-184.000.

Durkoppwerke GmbH: *See*—
Nicolay, Karl; and Hampel, Klaus, 4,446,803, Cl. 112-320.000.

Dursch, Friedrich: *See*—
Wang, Yu-Chang J.; Dursch, Friedrich; O'Laughlin, Richard L.; and Prusik, Thaddeus, 4,447,426, Cl. 424-243.000.

Dushane, Ray: *See*—
Mullich, Richard O.; and Dushane, Ray, 4,446,707, Cl. 70-134.000.

Dusza, John P.; Joseph, Joseph P.; and Berstein, Seymour, to American Cyanamid Company. 3-Trifluoroacetylamino-1-aryl-2-pyrazolines. 4,447,442, Cl. 424-273.00P.

Duwell, Edward C.; and Jones, Howell A., Jr., to Pitney Bowes Inc. Remote postage meter systems having variable user authorization code. 4,447,890, Cl. 364-900.000.

Dyce, John W.; Waters, Edwin R.; and Sherwood, Cy E., to Bendix Corporation, The. Apparatus for grounding and terminating a cable. 4,447,100, Cl. 339-14.00R.

Dynamit Nobel AG: *See—*
El-Chahawi, Moustafa, 4,447,644, Cl. 562-406.000.
Peeters, Hermann, 4,447,609, Cl. 544-317.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Simm, Manfred; Spiess, Karl-Heinz; and Weiss, Richard, 4,447,488, Cl. 428-213.000.

Dynie, Ernest R.; and Overy, Colin, to Black & Decker Inc. Power lawn rake. 4,446,681, Cl. 56-16.700.

E. Beaudrey & Cie: *See—*
Jackson, Philip, 4,447,323, Cl. 210-158.000.

E et M Lamort: *See—*
Lamort, Jean-Pierre J., 4,447,320, Cl. 209-273.000.

E. J. Brooks Company: *See—*
Guiler, Richard S., 4,446,603, Cl. 24-21.000.

E & J Gallo Winery: *See—*
Oliver, Robert; and Branscombe, Richard, 4,446,980, Cl. 215-276.000.

E. R. Squibb & Sons, Inc.: *See—*
Varma, Ravi K., 4,447,363, Cl. 260-397.300.
Wang, Yu-Chang J.; Dursch, Friedrich; O'Laughlin, Richard L.; and Prusik, Thaddeus, 4,447,426, Cl. 424-243.000.

Eastman Kodak Company: *See—*
Clark, R. Donald, 4,447,617, Cl. 548-164.000.
Geyer, Frederick F.; and Howe, Dennis G., 4,447,899, Cl. 369-111.000.
Johnson, Griffin I.; and Kiefer, Judy E., 4,447,646, Cl. 562-487.000.
Krutak, James J.; and Maleski, Robert J., 4,447,624, Cl. 549-69.000.
Ross, Robert E.; and Gaugh, Wilbur S., 4,447,523, Cl. 430-505.000.

Eaton Corporation: *See—*
Goscenski, Edward J., Jr., 4,446,697, Cl. 60-443.000.

Ebara, Hiroyuki: *See—*
Kohmoto, Kohtaro; Ebara, Hiroyuki; and Nira, Hisami, 4,447,756, Cl. 313-487.000.

Ebata, Yoshihiro; Kose, Saburo; and Hayami, Ryozo, to Agency of Industrial Science and Technology; and Ministry of International Trade and Industry. Adhesive for ceramic articles and method for adhesion thereof. 4,447,283, Cl. 156-325.000.

Eberle, Gunter. Method and apparatus for separating blood components. 4,447,220, Cl. 494-26.000.

Eberlein, Wolfgang: *See—*
Trummlitz, Gunter; Engel, Wolfhard; Eberlein, Wolfgang; Schmidt, Gunther; Hammer, Rudolf; and del Soldato, Piero, 4,447,434, Cl. 424-256.000.

Eckels, Phillip W., to Westinghouse Electric Corp. High-current cryogenic leads. 4,447,670, Cl. 174-15.0CA.

Eckhardt, Friedhelm: *See—*
Euteneuer, Edmund; and Eckhardt, Friedhelm, 4,447,167, Cl. 400-625.000.

Eder, Werner; and Fischer, Gisbert, to Danfoss A/S. Nozzle assembly with integrated PTC heater for prewarming fuel oil. 4,447,706, Cl. 219-299.000.

Edlund, Nils H.: *See—*
Jonsson, Jan U. E.; Blomgren, Rolf B. J. R.; and Edlund, Nils H., 4,446,661, Cl. 52-95.000.

Efner, Howard F.: *See—*
Smith, Clifford E.; Mark, Harold W.; Louthan, Rector P.; and Efner, Howard F., 4,447,246, Cl. 144-57.000.

Egami, Kazuhito: *See—*
Ban, Itsuki; Shiraki, Manabu; and Egami, Kazuhito, 4,447,751, Cl. 310-154.000.

Eggers, Manfred; and Zonak, Armin, to MaK Maschinenbau GmbH. Large-bore twin-weapon system for combat vehicles. 4,446,772, Cl. 89-37.00E.

Eguchi, Takao: *See—*
Mitamura, Gen; Eguchi, Takao; and Nagami, Yukio, 4,447,162, Cl. 368-295.000.

Ehlers, Kenneth W.: *See—*
Leung, Ka-Ngo; and Ehlers, Kenneth W., 4,447,732, Cl. 250-427.000.

Ehlinger, Edward E.: *See—*
Hung, William M.; and Ehlinger, Edward E., 4,447,616, Cl. 546-335.000.

Ehrmann, Peter; Fuchs, Dieter; and Spies, Karl-Heinrich, to Carl Freudenberg, Firma. Radial shaft sealing ring having a sealing lip and liquid deflectors. 4,447,064, Cl. 277-134.000.

Eickholt, Kathryn A., to Dow Chemical Company, The. Preparation of α-unsaturated carboxylic esters and amides from 1,2-dihaloalkanes by carbonylation. 4,447,640, Cl. 560-207.000.

Eifler, Raymond J.: *See—*
Punako, Stephen; Davis, Alan L.; and Eifler, Raymond J., 4,447,110, Cl. 339-262.0RR.

Eisenkraft, Arthur. Vision testing system. 4,447,141, Cl. 351-237.000.

Elbling, Irving N.: *See—*
Saunders, Howard E.; Westervelt, Dean C.; and Elbling, Irving N., 4,447,797, Cl. 336-205.000.

El-Chahawi, Moustafa, to Dynamit Nobel AG. Method for preparation of arylpyruvic acid. 4,447,644, Cl. 562-406.000.

Eldridge, John D., Jr., to Instranetics, Inc. Medical tubing holder. 4,447,238, Cl. 604-280.000.

Eldridge, Robert J.: *See—*
Lubbock, Frederick J.; Mok, Christopher C. K.; and Eldridge, Robert J., 4,447,475, Cl. 427-213.310.

Electrochemische Energieconversie, N.V.: *See—*
Blanchart, Alain P. O., 4,447,505, Cl. 429-42.000.

Elektrowatt Ingenieurunternehmung AG.: *See—*
Doroszlai, Pal; and Ferroni, Ferruccio, 4,447,729, Cl. 250-506.100.

Eliscu, Steven M.: *See—*
Lewis, Henry G., Jr.; and Eliscu, Steven M., 4,447,826, Cl. 358-27.000.

Elliott Brothers (London) Limited: *See—*
Corney, John M., 4,447,769, Cl. 318-564.000.

Elliott, George; Lenk, Pedro A.; and Shah, Jayantkumar R., to Stromberg-Carlson Corporation. Ring trip apparatus for a line circuit connected to DCO switch. 4,447,673, Cl. 179-18.0HB.

Ellis, James E.; Lidgard, Graham P.; Odstrchel, Gerald; and Riceberg, Louis J., to Corning Glass Works. Detecting intrinsic factor blocking site antibody. 4,447,528, Cl. 435-7.000.

Elpern, David G., to Bendix Corporation, The. Pressure regulator-accumulator for use with mechanical diaphragm pump. 4,446,837, Cl. 123-460.000.

Eltech Systems Corp.: *See—*
Hruska, Louis W.; and Tsai, Shan-Pu, 4,447,566, Cl. 523-221.000.

Ely, Laurice D. Keyboard lock. 4,446,708, Cl. 70-166.000.

Emde, Herbert; Blank, Heinz U.; and Schnegg, Peter, to Siemens-Allis, Inc. Process for the preparation of aminoarylsulphonic acids in sulfolene solvent. 4,447,368, Cl. 260-508.000.

EMI Limited: *See—*
Williams, Edward W., 4,447,762, Cl. 315-116.000.

Emonet, Henri, to Maco-Meuden. Compressed air distributor for a reciprocating concrete breaking type machine. 4,446,773, Cl. 91-317.000.

Empson, Kenneth G., to Southern Pacific Transportation Company. Motor driven exciter. 4,446,734, Cl. 73-586.000.

En-Save, Inc.: *See—*
Steigelmann, William H., 4,446,852, Cl. 126-432.000.

Enberg, Erik R.; and Plank, J. Douglas, to Perfecto, Inc. Rewind apparatus for metal strips. 4,447,016, Cl. 242-56.900.

Endo, Akira: *See—*
Kimura, Katsuhiro; Endo, Akira; and Takezaki, Jiro, 4,446,826, Cl. 123-143.00B.

Endo, Hiroshi: *See—*
Kasuya, Hideo; and Endo, Hiroshi, 4,447,800, Cl. 340-904.000.

Endo, Kazuyuki; and Makino, Shigeo, to Bridgestone Tire Company Limited. Heavy duty pneumatic radial tires. 4,446,901, Cl. 152-209.00R.

Endo, Norio; Asayama, Yoshiaki; and Kabuto, Masami, to Mitsubishi Denki Kabushiki Kaisha; and Mitsubishi Jidosha Kogyo K.K. Suction system in an engine. 4,446,824, Cl. 123-52.00M.

Endo, Takeyuki: *See—*
Kodama, Kazuyuki; Endo, Takeyuki; Okada, Kunihiro; and Shibuya, Yasutaka, 4,447,809, Cl. 340-747.000.

Endoscopy Surgical Systems, Inc.: *See—*
Kotsanis, Constantine A., 4,447,227, Cl. 604-95.000.

Energy Conversion Devices, Inc.: *See—*
Jayadev, Tumkur S.; and Nugyen, On V., 4,447,277, Cl. 148-400.000.

Engel, Wolfhard: *See—*
Trummlitz, Gunter; Engel, Wolfhard; Eberlein, Wolfgang; Schmidt, Gunther; Hammer, Rudolf; and del Soldato, Piero, 4,447,434, Cl. 424-256.000.

Englar, Donald G.; and Altman, Robert G., to United States of America, Army. Sampling device. 4,447,395, Cl. 422-68.000.

Engle, Edward J., III, to Hercules, Incorporated. Adhesive process. 4,447,495, Cl. 428-429.000.

English Clays Lovering Pochin & Co. Ltd.: *See—*
Clark, Norman O., 4,447,327, Cl. 210-350.000.

Enomoto, Seiji: *See—*
Takemae, Yoshihiro; Enomoto, Seiji; Nozaki, Shigeki; Mezawa, Tsutomu; and Kabashima, Katsuhiko, 4,447,745, Cl. 307-269.000.

Ensco Inc.: *See—*
Page, Edward A.; and Babel, Carl R., 4,447,123, Cl. 350-96.240.

Environmental Testing & Certif. Corp.: *See—*
Loucks, Terry L., 4,446,705, Cl. 62-372.000.

Envirotech Corporation: *See—*
Bradley, Kirk D.; Koski, Robert R.; and Clark, James W., 4,447,072, Cl. 280-492.000.

Epstein, Edward A.: *See—*
Farrell, Gregory A.; and Epstein, Edward A., 4,447,883, Cl. 364-555.000.

Equipment Development Co.: *See—*
Harding, Edward M., 4,446,845, Cl. 125-13.0SS.

Ernest, Ivan: *See—*
Gosteli, Jacques; Ernest, Ivan; and Woodward, Robert B., 4,447,360, Cl. 260-239.00A.

Ernst Leitz Wetzlar GmbH: *See—*
Heitmann, Knut; and Schaefer, Klaus-Dieter, 4,447,143, Cl. 354-407.000.

Escher Wyss GmbH: *See—*
Bubik, Alfred; Dahl, Hans; Holik, Herbert; Kurtz, Rudiger; and Seider, Werner, 4,447,295, Cl. 162-300.000.

Esser, Karl-Josef, to Scharmann GmbH & Co. Horizontal drilling and milling machine with a headstock moving up and down in guides. 4,447,178, Cl. 409-80.000.

Essex Group, Inc.: *See—*
Mierzwinski, Eugene P., 4,447,692, Cl. 219-10.55B.

Minnick, Michael G.; Connell, James J.; and McGregor, Charles W., 4,447,472, Cl. 427-120.000.

Etat Francais represente par le Delegue General pour l'Armement: *See*—
Sedat, Georges A., 4,447,278, Cl. 149-19.910.

Ethicon, Inc.: *See*—
Jewusiak, Stephen J., 4,446,865, Cl. 128-321.000.

Ethridge, Edwin C.: *See*—
Dunn, Stanley A.; Pomplun, Alan R.; Paquette, Elmer G.; Ethridge, Edwin C.; and Johnson, Jerry. L., 4,447,251, Cl. 65-142.000.

Ethyl Corporation: *See*—
Ashby, Eugene C., 4,447,369, Cl. 260-665.00R.
Li, Hsueh M., 4,447,408, Cl. 423-300.000.

Eubanks Engineering Company: *See*—
Talley, Lloyd A., 4,446,615, Cl. 29-742.000.

Ewe, Ludwig: *See*—
Dickore, Karlfried; Sasse, Klaus; Ewe, Ludwig; and Schmidt, Robert R., 4,447,258, Cl. 71-93.000.

Euteneuer, Edmund; and Eckhardt, Friedhelm, to U.S. Philips Corporation. Stacking device for data carriers. 4,447,167, Cl. 400-625.000.

Evans, Orde R., to Oreco III, Inc. Conduit assembly. 4,447,076, Cl. 285-55.000.

Evans, William E.; and Gillett, Jimmie D., to Varo, Inc. Multiphase inverter drive circuit with synchronized switching delay feature. 4,447,867, Cl. 363-56.000.

Ewe, Henning: *See*—
Brennecke, Peter W. R.; Ewe, Henning; and Justi, Eduard W., 4,447,302, Cl. 204-128.000.

Ex-Cell-O Corporation: *See*—
Brandstadter, Jack M., 4,447,073, Cl. 280-705.000.
Wise, Daniel J., 4,446,971, Cl. 206-607.000.

Exanno Products Limited: *See*—
Sullivan, Michael T., 4,447,079, Cl. 285-363.000.

Excellon Industries: *See*—
Neumann, Don B., 4,447,723, Cl. 250-236.000.

Exxon Research and Engineering Co.: *See*—
Fung, Shun C.; and Rice, Richard W., 4,447,551, Cl. 502-37.000.
Lundberg, Robert D.; Walker, Thad O.; O'Farrell, Charles P.; and Makowski, Henry S., deceased, 4,447,338, Cl. 252-8.50M.

F. J. Gattys Ingenierburo: *See*—
Gattys, Franz J., 4,447,476, Cl. 427-215.000.

Fail Safe Industries, Inc.: *See*—
Wise, Stanley S.; and Maitland, Peter, 4,446,950, Cl. 192-3.0TR.

Falchle, Jorg: *See*—
Bleicher, Manfred; Buck, Manfred; Falchle, Jorg; and Wanner, Karl, 4,446,931, Cl. 173-48.000.

Fang, Frank F.; and McGroddy, James C., to International Business Machines Corporation. Digital photodetectors. 4,447,746, Cl. 307-311.000.

Farag, Samir F.; Hoffmann, Alvin R.; and Kleinecke, John D., to Siemens-Allis, Inc. Rigid subchassis structure for motor control center or the like. 4,447,858, Cl. 361-429.000.

Farcy, Jean-Claude: *See*—
Pugliese, Vincent; and Farcy, Jean-Claude, 4,447,789, Cl. 330-4.300.

Farines, Jean-Michel. Swivelling device for spreading liquids by spraying. 4,447,007, Cl. 239-165.000.

Farmitalia Carlo Erba S.p.A.: *See*—
Franceschi, Giovanni; Marsili, Leonardo; Sanfilippo, Aurora; and Vioglio, Sergio, 4,447,432, Cl. 424-248.540.

Farnham, William B., to Du Pont de Nemours, E. I., and Company. Nonhygroscopic, anionic pentacoordinate silicate. 4,447,628, Cl. 556-415.000.

Farrell, Gregory A.; and Epstein, Edward A., to Technicon Instruments Corporation. Coincidence-error correcting apparatus and method. 4,447,883, Cl. 364-555.000.

Faulkner, D. John: *See*—
Jacobs, Robert S.; and Faulkner, D. John, 4,447,445, Cl. 424-279.000.

Faulkner, Richard D.; Henry, Dale V.; and Muth, David L., to RCA Corporation. Broad area cathode contact for a photomultiplier tube. 4,447,758, Cl. 313-532.000.

Faure, Alphonse; and Magne, Robert, to Rhone-Poulenc Industries. Redistribution of tetramethylsilane/dimethyldichlorosilane into trimethylchlorosilane. 4,447,631, Cl. 556-469.000.

Federmann, Dieter: *See*—
Roos, Rudolf; and Federmann, Dieter, 4,447,086, Cl. 296-217.000.

Feierlein, Heinz: *See*—
Jaumann, Leonhard; Tima, Zdenek; and Feierlein, Heinz, 4,447,033, Cl. 248-563.000.

Feldman, Julian, to National Distillers and Chemical Corporation. Process for recovering oxygenated organic compounds from dilute aqueous solutions employing liquid extraction media. 4,447,643, Cl. 560-248.000.

Feldmann, Rainer: *See*—
Horlbeck, Gernot; and Feldmann, Rainer, 4,447,573, Cl. 524-394.000.

Fenne, Ivor: *See*—
Mowbray, Dorian F.; Fenne, Ivor; and Andrews, Richard J., 4,446,836, Cl. 123-450.000.

Fenne, Kenneth R. Hand-held light with swivel head. 4,447,863, Cl. 362-199.000.

Ferguson, James H.; and Calderwood, Murray W., to Canadian General Electric Company Limited. Rotor withdrawal arrangement for bulb generators. 4,447,739, Cl. 290-52.000.

Ferreira, Thomas. Chafing gear for fishing drag. 4,446,637, Cl. 37-55.000.

Ferrer, John J., to Hughes Aircraft Company. Diffraction head up display solar radiation filter. 4,447,128, Cl. 350-174.000.

Ferris, John A. Release compositions for asphalt roofing materials and methods of use. 4,447,500, Cl. 428-489.000.

Ferroni, Ferruccio: *See*—
Doroszlai, Pal; and Ferroni, Ferruccio, 4,447,729, Cl. 250-506.100.

Fey, Jean-Jacques, to Compagnie Francaise des Petroles. Method of tracing a well drilling mud. 4,447,340, Cl. 252-8.50C.

Fidi, Werner, to AKG Akustische u.Kino-gerate Gesellschaft mbH. Electracoustic transducer. 4,447,678, Cl. 179-115.5PS.

Fieber, Werner H.; Hinze, Klaus; Huth, Manfred K. O.; Jost, Hans-Georg; Lamm, Klaus D.; Michalski, Dieter; and Rittaler, Konstantin, to ITT Industries, Inc. Pushbutton switch or pushbutton-actuated slide switch. 4,447,686, Cl. 200-153.00J.

Fielding, Brian S., to Hardware Designers, Inc. Self-leveling drawer slide. 4,447,095, Cl. 308-3.800.

Finch, Harry: *See*—
Collington, Eric W.; Finch, Harry; and Newton, Roger F., 4,447,428, Cl. 424-244.000.

Fink, Hans-Ferdi; Koerner, Gotz; and Luksch, Edmund, to Th.Goldschmidt AG. Use of organopolysiloxanes in the manufacture of paper-coated plaster boards. 4,447,498, Cl. 428-447.000.

Finkle, Mark A.: *See*—
Bertsch, Dieter A.; Finkle, Mark A.; and Fishman, James D., 4,447,218, Cl. 493-251.000.

Finnigan Corporation: *See*—
Stafford, George C.; and Bradford, Donald C., 4,447,728, Cl. 250-423.00R.

Firestone, Raymond A.; Cama, Lovji D.; and Christensen, Burton G., to Merck & Co., Inc. Process to prepare 7-substituted cephalosporins or 6-substituted penicillins. 4,447,602, Cl. 544-21.000.

Firestone Tire & Rubber Company, The: *See*—
Baldoni, Viscardo; and Vorih, William J., 4,447,171, Cl. 403-381.000.
Higbee, Wallace C., 4,447,018, Cl. 242-107.200.

Firmenich SA: *See*—
Naf, Regula; Morris, Anthony F.; and Naf, Ferdinand, 4,447,627, Cl. 549-548.000.

Firth, Bruce E.; and Rosen, Terry J., to UOP Inc. Preparation of ortho-alkylated phenols. 4,447,657, Cl. 568-783.000.

Fischer, Friedrich L., to International Business Machines Corporation. Symmetrical three degree of freedom compliance structure. 4,447,048, Cl. 267-141.100.

Fischer, Gisbert: *See*—
Eder, Werner; and Fischer, Gisbert, 4,447,706, Cl. 219-299.000.

Fischer, Karl. Electric heater. 4,447,711, Cl. 219-464.000.

Fishman, Howard M., to Franklin Institute. Self-compensating centrifuge arm. 4,446,716, Cl. 73-1.0DC.

Fishman, James D.: *See*—
Bertsch, Dieter A.; Finkle, Mark A.; and Fishman, James D., 4,447,218, Cl. 493-251.000.

Flierl, Erwin: *See*—
Harbauer, Werner; Drexler, Johann; and Flierl, Erwin, 4,447,794, Cl. 335-128.000.

Floyd, Raymond C., to Mead Corporation, The. Blow-out protector packer element. 4,447,038, Cl. 251-1.00B.

Flygstad, Dean W.; and Wehrmacher, Bill H., to Telex Communications, Inc. Recording apparatus for cassette copying. 4,447,836, Cl. 360-15.000.

FMC Corporation: *See*—
Imerman, Curtis E.; Langerud, David S.; and Thomas, Brian H., 4,446,976, Cl. 212-189.000.

Focht, Louis R., to Ford Motor Company. Engine pressure and knock sensor. 4,446,724, Cl. 73-35.000.

Foley, John T.: *See*—
Bilstad, Arnold C.; and Foley, John T., 4,447,191, Cl. 417-12.000.

Fong, Anthony S., to Data General Corporation. Improved apparatus for representing the size of an element in a compound data item and deriving addresses and lengths using the element size. 4,447,879, Cl. 364-200.000.

Ford Aerospace & Communications Corporation: *See*—
Kay, Robert E., 4,447,470, Cl. 427-76.000.
Stahlhuth, Paul H., 4,446,750, Cl. 74-1.500.

Ford Motor Company: *See*—
Ackerman, Allen D.; and Aula, Howard A., 4,446,906, Cl. 164-112.000.
Focht, Louis R., 4,446,724, Cl. 73-35.000.
Giardini, Dante S.; Iwanski, Richard V.; and Trumpy, David K., 4,446,825, Cl. 123-90.650.
McCrary, Paul T., 4,446,759, Cl. 74-867.000.
Simko, Aladar O.; Havstad, Peter H.; and Harrington, Joseph A., 4,446,830, Cl. 123-276.000.

Forester, Buford G.: *See*—
Redmon, Billy L.; and Forester, Buford G., 4,446,887, Cl. 137-556.000.

Forrest Mountaineering, Inc.: *See*—
Forrest, William E.; and Lupton, Frank R., 4,446,944, Cl. 182-3.000.

Forrest, William E.; and Lupton, Frank R., to Forrest Mountaineering, Inc. Shock absorbing device and method. 4,446,944, Cl. 182-3.000.

Forsberg, John W., to Lubrizol Corporation, The. Carboxylic solubilizer/surfactant combinations and aqueous compositions containing same. 4,447,348, Cl. 252-75.000.

Foster, Larry W.: *See*—
Spurlock, Robert C.; and Foster, Larry W., 4,447,382, Cl. 264-123.000.

Foster, Richard G.: *See*—
Bjornholt, John E.; Foster, Richard G.; and Groth, Edward J., Jr., 4,447,907, Cl. 375-1.000.

Foster Wheeler Energy Corporation: *See*—
Stewart, Robert D.; and Gamble, Robert L., 4,446,629, Cl. 34-57.00A.

Fowles, Patrick E.; Shoemaker, Gerald L.; and Yan, Tsoung-Yuan, to Mobil Oil Corporation. Dewaxing process. 4,447,311, Cl. 208-35.000.

Fox, Merlin D.: *See*—
Souder, James J., Jr.; Scarborough, Edward D., Jr.; Fox, Merlin D.; Rettich, Donald R.; and Mason, Robert L., 4,447,031, Cl. 248-280.100.

Franceschi, Giovanni; Marsili, Leonardo; Sanfilippo, Aurora; and Vioglio, Sergio, to Farmitalia Carlo Erba S.p.A. Azino rifamycins. 4,447,432, Cl. 424-248.540.

Franke, Rainer: *See*—
Berthold, Joachim; Diedrich, Bernd; Franke, Rainer; Hartlapp, Jurgen; Schafer, Werner; and Strobel, Wolfgang, 4,447,587, Cl. 526-124.000.

Franklin, Benjamin S.: *See*—
Bradley, John J.; Franklin, Benjamin S.; Slosberg, David M.; Appell, Marc; Cassonnet, Jean-Claude; and De Sabatier, Philippe D., 4,447,874, Cl. 364-200.000.

Franklin Institute: *See*—
Fishman, Howard M., 4,446,716, Cl. 73-1.0DC.

Franz, Helmut; Duffer, Paul F.; and Kelly, Joseph D., to PPG Industries, Inc. Organotin surface treatment and interleaving material for glass sheets. 4,447,496, Cl. 428-432.000.

Frass, Werner; and Horn, Klaus, to Hoechst Aktiengesellschaft. Process for producing relief copies in light hardenable materials with ultrasonic treatment. 4,447,510, Cl. 430-3.000.

Frederick, John R.: *See*—
Lawrence, Jackson; Webb, Harry A.; and Frederick, John R., 4,446,606, Cl. 26-18.600.

Freelund, Avrum A.: *See*—
Sugahara, Byron M.; Freelund, Avrum A.; and Zinger, George, 4,446,805, Cl. 114-76.000.

French, Errol J. Self-contained vault unit. 4,446,797, Cl. 109-53.000.

French, Robert J.; and Dorony, Elmer F., to Interior Steel Equipment Co. Locker construction. 4,447,099, Cl. 312-257.00R.

Fricke, Hermann: *See*—
Mueller, Dieter J.; Fricke, Hermann; and Spielbrink, Heinrich, 4,447,273, Cl. 148-6.15R.

Fridh, Carl-Erik: *See*—
Sallnert, Kjell; Fridh, Carl-Erik; and Hansson, Manfred, 4,446,710, Cl. 72-10.000.

FRIED. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Coenen, Hubert; and Kriegel, Ernst, 4,446,921, Cl. 166-267.000.

Friedrich, Heinz: *See*—
Beschke, Helmut; Friedrich, Heinz; and Heilos, Johannes, 4,447,612, Cl. 546-285.000.
Beschke, Helmut; Dahm, Franz-Ludwig; Friedrich, Heinz; and Prescher, Gunter, 4,447,614, Cl. 546-316.000.
Beschke, Helmut; Dahm, Franz-Ludwig; Friedrich, Heinz; and Prescher, Gunter, 4,447,615, Cl. 546-317.000.

Friedrich, Herbert: *See*—
Martini, Thomas; Schinzel, Erich; Frischkorn, Hans; Friedrich, Herbert; and Probst, Heinz, 4,447,350, Cl. 252-301.220.

Friedson, Belvin F., to Windmere Corporation. Foot treatment apparatus. 4,446,855, Cl. 128-24.200.

Friend, Kent: *See*—
Nguyen, Liem; Segal, William J.; and Friend, Kent, 4,447,091, Cl. 301-37.0AT.

Friesenhahn, Stanley J., to IRT Corporation. Large area neutron proportional counter and portal monitor detector. 4,447,727, Cl. 250-390.000.

Frigomat S.a.s. di Alberto Cipelletti & C.: *See*—
Cipelletti, Alberto, 4,446,778, Cl. 99-455.000.

Frimml, Roger W.; and Meiers, Gerald F., to Deere & Company. Cylindrical baler with flare sheets on crop pickup. 4,446,684, Cl. 56-341.000.

Frisch, Eldon E.; and Parks, Leon C., to Dow Corning Corporation; and Research Against Cancer, Inc., a part interest. Valving slit construction and cooperating assembly for penetrating the same. 4,447,237, Cl. 604-175.000.

Frischkorn, Hans: *See*—
Martini, Thomas; Schinzel, Erich; Frischkorn, Hans; Friedrich, Herbert; and Probst, Heinz, 4,447,350, Cl. 252-301.220.

Fuchs, Dieter: *See*—
Ehrmann, Peter; Fuchs, Dieter; and Spies, Karl-Heinrich, 4,447,064, Cl. 277-134.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Kasai, Yoshiaki; and Ohgami, Masaaki, 4,447,880, Cl. 364-431.050.

Fuji Photo Film Co., Ltd.: *See*—
Fukui, Takashi, 4,447,154, Cl. 356-404.000.
Hirano, Shigeo; and Takagi, Yoshihiro, 4,447,522, Cl. 430-405.000.
Kitamoto, Tatsuji; and Shirahata, Ryuji, 4,446,816, Cl. 118-718.000.
Kondo, Syun-ichi; Sano, Kenji; and Sato, Hideo, 4,447,515, Cl. 430-83.000.
Maekawa, Masakazu; and Matsukawa, Hiroharu, 4,447,487, Cl. 346-200.000.
Miyamoto, Akio, 4,447,075, Cl. 346-213.000.
Nagorski, Boguslaw A., 4,447,019, Cl. 242-192.000.

Fuji Xerox Co., Ltd.: *See*—
Kurata, Masami; and Moriguchi, Fujio, 4,447,818, Cl. 346-76.0PH.
Kurata, Masami; Moriguchi, Fujio; Inui, Toshiharu; and Ohmori, Takashi, 4,447,832, Cl. 358-296.000.
Moriguchi, Haruhiko; and Ohmori, Takashi, 4,447,819, Cl. 346-76.0PH.
Sone, Yasuo, 4,447,054, Cl. 271-311.000.

Fujii, Takashi, to Aisin Seiki Kabushiki Kaisha. Brake booster for vehicles. 4,446,699, Cl. 60-547.100.

Fujikawa, Yoshihiro: *See*—
Suzuki, Fumio; Fujikawa, Yoshihiro; Yamamoto, Susumu; Mizutani, Hidemi; Ohya, Tunehiko; Ikai, Takashi; and Oguchi, Toshihiko, 4,447,256, Cl. 71-86.000.

Fujisawa, Hideya: *See*—
Matsumura, Toshimi; Fujisawa, Hideya; Omori, Norio; Arimura, Takashi; Yamazoe, Hisamitsu; and Nishiura, Kiyotaka, 4,446,832, Cl. 123-339.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Kishimoto, Teiji; Kochi, Hiromu; and Kato, Masayuki, 4,447,436, Cl. 424-258.000.
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,447,430, Cl. 424-246.000.
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, 4,447,429, Cl. 424-246.000.

Fujiso, Tokuo; Ohmori, Tadashi; and Nomura, Soichi, to Nippon Oil Co., Ltd. Process for re-activation of solid acid catalyst. 4,447,553, Cl. 502-36.000.

Fujita, Hiromu, to Osaka Taiyo Co., Ltd. Device for lifting a table. 4,447,041, Cl. 254-9.00R.

Fujita, Shozo; Futatsuishi, Shunichi; and Takushima, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Movable large display device. 4,446,643, Cl. 40-590.000.

Fujitsu Fanuc Limited: *See*—
Imazeki, Ryoji; and Inoue, Michiya, 4,447,887, Cl. 364-900.000.
Yamazaki, Etuo, 4,447,179, Cl. 409-127.000.

Fujitsu Limited: *See*—
Murakami, Jyoji, 4,447,893, Cl. 365-203.000.
Suzuki, Hirokazu; and Akiyama, Takehiro, 4,447,704, Cl. 219-216.000.
Takahashi, Yoshihiro; Okuyama, Katsuo; and Matsukuma, Yutaka, 4,447,856, Cl. 361-383.000.
Takemae, Yoshihiro; Enomoto, Seiji; Nozaki, Shigeki; Mezawa, Tsutomu; and Kabashima, Katsuhiko, 4,447,745, Cl. 307-269.000.

Fujiwara, Masami: *See*—
Fukuda, Ryuichi; Fujiwara, Masami; and Ishiguro, Norio, 4,447,790, Cl. 330-149.000.

Fujiwara, Shinobu: *See*—
Masujima, Sho; Shibuya, Masahide; Shoichi, Iwaya; Umeda, Kenichi; Oikawa, Yasunobu; Abe, Hisao; Midori, Yoshifumi; Fujiwara, Shinobu; and Kikuchi, Nobuaki, 4,447,549, Cl. 501-138.000.

Fukayama, Miyoji; and Ichiijo, Chikara, to Toray Silicone Company, Ltd. Room temperature vulcanizable polyorganosiloxane compositions which are paintable following curing. 4,447,576, Cl. 524-714.000.

Fukuda, Ryuichi; Fujiwara, Masami; and Ishiguro, Norio, to Nippon Columbia Kabushikikaisha. Distortion eliminating circuit. 4,447,790, Cl. 330-149.000.

Fukui, Hiroaki: *See*—
Omae, Yoshihiro; Okubo, Noboru; Sigyo, Keiichi; Nakajima, Hideo; Fukui, Hiroaki; Yamada, Toshio; and Honda, Hideyuki, 4,447,805, Cl. 340-539.000.

Fukui, Takashi, to Fuji Photo Film Co., Ltd. Method for detecting focus of image. 4,447,154, Cl. 356-404.000.

Fuller, Francis W.: *See*—
Merritt, Paul H.; and Fuller, Francis W., 4,446,607, Cl. 29-33.00E.

Fuller, Robert T.; and Sanders, Robert J. Display system for stiff flat samples. 4,446,973, Cl. 211-45.000.

Funakoshi, Wataru; and Urasaki, Takanori, to Teijin Limited. Melt-anisotropic wholly aromatic polyester and fibers or films thereof. 4,447,593, Cl. 528-176.000.

Funato, Masatomi: *See*—
Miyakawa, Nobuhiro; Higashiguchi, Teruaki; Sano, Yumiko; and Funato, Masatomi, 4,447,513, Cl. 430-58.000.

Fung, Shun C.; and Rice, Richard W., to Exxon Research and Engineering Co. Process for reactivating iridium-containing catalysts. 4,447,551, Cl. 502-37.000.

Fuqua, Debra L.: *See*—
Loos, Patricia J.; Fuqua, Debra L.; and Drzewiecki, Paul J., 4,447,461, Cl. 426-589.000.

Furrer, Peter: *See*—
Schwander, Hansrudolf; and Furrer, Peter, 4,447,358, Cl. 260-205.000.

Further, Gunter. Diabetic set. 4,446,970, Cl. 206-569.000.

Furuhata, Kimio: *See*—
Ogura, Haruo; Furuhata, Kimio; Osawa, Toshiaki; Toyoshima, Satoshi; Shitori, Yoshiyasu; and Ito, Masayoshi, 4,447,600, Cl. 536-23.000.

Furukawa, Noboru: *See*—
Yuasa, Kazuhiro; and Furukawa, Noboru, 4,447,821, Cl. 346-154.000.

Furuya, Koutaro; Hosoda, Kazuho; Takeuchi, Takahito; Ishikura, Yasuyuki; and Kameda, Morihiro, to Keiai Orthopedic Appliance Co., Ltd. Prosthetic foot structure. 4,446,580, Cl. 3-6.000.

Fushida, Akira: *See*—
Nakazawa, Toru; Fushida, Akira; and Kamezaki, Yasushi, 4,447,514, Cl. 430-81.000.
Futatsuishi, Shunichi: *See*—
Fujita, Shozo; Futatsuishi, Shunichi; and Takushima, Takashi, 4,446,643, Cl. 40-590.000.
Gach, Peter P.; and Bush, Randall G., to Sunbeam Plastics Corporation. Tamper indicating closure. 4,446,979, Cl. 215-203.000.
Gaffney, Anne M.; and Sofranko, John A., to Atlantic Richfield Company. Preparation of dialkyl oxalates by the oxidative carbonylation of alcohols with a heterogeneous Pd-V-P-Ti containing catalyst system. 4,447,638, Cl. 560-204.000.
Gaffney, Anne M.: *See*—
Sofranko, John A.; and Gaffney, Anne M., 4,447,639, Cl. 560-204.000.
Gage, Clifford H., to Kowalczyk, Annette. Turnover mechanism. 4,447,000, Cl. 227-49.000.
Gaines, Donald R.: *See*—
Trudeau, William H.; Gaines, Donald R.; and Smallegan, Jon M., 4,447,094, Cl. 308-2.00R.
Gala Industries, Inc.: *See*—
Pauley, General J., 4,447,325, Cl. 210-295.000.
Galbreath, Richard N., to Structural Accessories, Inc. Roadway expansion joint and seal. 4,447,172, Cl. 404-68.000.
Galson Research Corporation: *See*—
Peterson, Robert L., 4,447,541, Cl. 435-264.000.
Galtz, Rudiger; and Reinhardt, Rudolf, to Webasto-Werk W. Baier GmbH & Co. Lateral-duct fan. 4,447,187, Cl. 415-53.00R.
Gamble, Robert L.: *See*—
Stewart, Robert D.; and Gamble, Robert L., 4,446,629, Cl. 34-57.00A.
Gambro AG: *See*—
Riede, Gerhard; and Christopherson, Kjell H. I., 4,447,326, Cl. 210-321.300.
Gantzer, Mary L., to Miles Laboratories, Inc. Analytical test composition, device and method for the determination of peroxidatively active substances. 4,447,542, Cl. 436-66.000.
GAO Gesellschaft fur Automation und Organisation mbH: *See*—
Weilacher, Karl H., 4,446,735, Cl. 73-597.000.
Garcia, Richard J. Multi-purpose tool. 4,446,588, Cl. 7-138.000.
Garrison, Judd F., to John Thomas Batts, Inc. Means of securing garment clamps to hanger. 4,446,996, Cl. 223-96.000.
Gates Rubber Company, The: *See*—
Clinefelter, Richard L.; and Bradford, Larry R., 4,446,903, Cl. 152-323.000.
Gray, Herbert W.; and Payne, Roger A., 4,447,378, Cl. 264-45.900.
Gattys, Franz J., to F. J. Gattys Ingenierburo. Process for stabilizing dehydrated magnesium chloride against rehydration. 4,447,476, Cl. 427-215.000.
Gaugh, Wilbur S.: *See*—
Ross, Robert E.; and Gaugh, Wilbur S., 4,447,523, Cl. 430-505.000.
Gaunt, Thomas N.: *See*—
Harrison, Peter; and Gaunt, Thomas N., 4,447,479, Cl. 428-35.000.
Gautier, Jean-Claude: *See*—
Bergeret, Wilfrid; Gautier, Jean-Claude; Raynal, Serge; and Boileau, Sylvie, 4,447,584, Cl. 525-340.000.
Gay, John C.; McCurdy, H. Dennis; and Rose, Wayne B., to Cutter Laboratories, Inc. Carnivore anthelmintics. 4,447,414, Cl. 424-81.000.
Gay, Richard L.; Kohl, Arthur L.; and Yosim, Samuel J., to Rockwell International Corporation. Destruction of halogen-containing materials. 4,447,262, Cl. 75-65.00R.
Gebelius, Sven R. V. Method for repairing and/or reinforcing a pipe system, and a device for utilization of the method. 4,446,891, Cl. 138-97.000.
Geerdes, Dirk J. F.; and Nelen, Petrus J. C., to Akzo N.V. Aqueous, oxidatively drying coating composition. 4,447,567, Cl. 523-501.000.
Gehm, Robert: *See*—
Horn, Peter; Gehm, Robert; Marx, Matthias; and Roeber, Artur, 4,447,561, Cl. 521-118.000.
Geissler, Joachim; and Helmreich, Dieter, to Heliotronic Forschungs- und Entwicklungsgesellschaft fur Solarzellen-Grundstoffe mbH. Process for the manufacture of coarsely crystalline to monocrystalline sheets of semiconductor material. 4,447,289, Cl. 156-608.000.
Gelfman, Stanley, to Krischer Metal Products Co., Inc. Heating accessory. 4,446,776, Cl. 99-401.000.
Gelinas, Raymond C., to Honeywell Inc. Apparatus and method for determination of a receiving device relative to a transmitting device utilizing a curl-free magnetic vector potential field. 4,447,779, Cl. 324-207.000.
General Electric Company: *See*—
Carlson, Richard O., 4,447,799, Cl. 338-22.00R.
Castonguay, Roger N., 4,447,682, Cl. 200-50.0AA.
Cohen, Robert K., 4,447,700, Cl. 219-117.100.
Cote, Paul T., 4,447,765, Cl. 315-240.000.
Haag, Donald L., 4,446,614, Cl. 29-622.000.
Hetzel, Frederick; Graf, Martin J.; and Seredich, Douglas, 4,447,861, Cl. 362-216.000.
Jackson, Melvin R.; and Rairden, John R., III, 4,447,466, Cl. 427-34.000.
Kornrumpf, William P.; and Cote, Paul T., 4,447,764, Cl. 315-240.000.
Massey, William A., 4,447,843, Cl. 361-76.000.
Mendiratta, Ashok K., 4,447,655, Cl. 568-724.000.
Miller, Russell S.; Dietz, Peter W.; and Bray, Christopher, 4,446,910, Cl. 165-1.000.
Sargisson, Donald F.; and Harshman, Daniel L., 4,446,696, Cl. 60-226.300.
Shanks, Bruce E., 4,447,862, Cl. 362-267.000.
Turnbull, Fred G., 4,447,868, Cl. 363-81.000.
VanHorn, David D.; Putz, John M.; and Henderson, Alfred J., Jr., 4,447,865, Cl. 362-305.000.
Wilkinson, Stanley B., 4,447,845, Cl. 361-80.000.
Williams, Robert E., Jr., 4,447,630, Cl. 556-460.000.
Wynn, Stephen R., 4,447,792, Cl. 332-19.000.
General Motors Corporation: *See*—
Arlauskas, Alfonsas, 4,446,596, Cl. 16-333.000.
Cataldo, Roy S., 4,446,821, Cl. 123-26.000.
Dennis, Robert P., 4,446,809, Cl. 116-28.100.
Lambert, David K., 4,446,719, Cl. 73-23.000.
Melinat, Wolfgang, 4,446,948, Cl. 188-73.450.
General Tire & Rubber Company, The: *See*—
Dupuy, Ronald E.; and Clark, John E., 4,447,065, Cl. 277-184.000.
Generalimpex Kulkereskedelmi Vallalat: *See*—
Hollosy, 4,447,057, Cl. 273-116.000.
Genpak Corporation: *See*—
Bowen, Gary D.; and Bowen, James L., 4,446,986, Cl. 220-307.000.
Gerber, Dennis H., to Burke Industries, Inc. Reservoir cover having a defined peripheral sump. 4,446,983, Cl. 220-219.000.
Gerber Products Company: *See*—
Breuker, Stephen J.; and Richmann, Harold L., 4,447,775, Cl. 324-438.000.
Gerwick, Ben C., III, to Dow Chemical Company, The. Inhibiting the antagonism between pyridyloxy-phenoxy alkanoate herbicides and benzothiadiazinone herbicides in post-emergent applications. 4,447,257, Cl. 71-91.000.
Gesson, Jean-Pierre: *See*—
Jouannetaud, Marie-Paule; Gesson, Jean-Pierre; and Jacquesy, Jean-Claude, 4,447,660, Cl. 568-774.000.
Gestetner Manufacturing Limited: *See*—
Stevens, Colin R.; and Ababurko, Victor, 4,446,791, Cl. 101-122.000.
Getman, Harlan R.: *See*—
Roth, Thomas E.; and Getman, Harlan R., 4,447,458, Cl. 426-275.000.
Gewerkschaft Eisenhutte Westfalia: *See*—
Becker, Kunibert; Dunkel, Gerd; Lagodka, Gunter; and Kirchbrucher, Rudiger, 4,447,174, Cl. 405-293.000.
Geyer, Frederick F.; and Howe, Dennis G., to Eastman Kodak Company. Optical disc method, media and apparatus for writing and/or reading information. 4,447,899, Cl. 369-111.000.
Ghigliotti, Giovanni; and Lancella, Attilio, to Connei S.p.A. Socket member for an electrical connector. 4,447,108, Cl. 339-256.0RT.
Ghiurea, Florin C. V., to Institutul de Cercetarea Stiintifica si Inginerie Tehnologica Pentru Industria Electrotehnica. Piezoelectric transducer accelerometer. 4,447,755, Cl. 310-329.000.
Giammarco, Giuseppe, deceased; and by Giammarco, Paolo, heir. Process for the conversion of carbon monoxide into hydrogen and carbon dioxide. 4,447,410, Cl. 423-655.000.
Giammarco, Paolo, heir: *See*—
Giammarco, Giuseppe, deceased; and Giammarco, Paolo, heir, 4,447,410, Cl. 423-655.000.
Giardini, Dante S.; Iwanski, Richard V.; and Trumpy, David K., to Ford Motor Company. Internal combustion engine with valves having a variable spring rate. 4,446,825, Cl. 123-90.650.
Gibbs, Robert L. Disk deployment of expendables. 4,446,793, Cl. 102-505.000.
Gibson, David K., to International Business Machines Corporation. Grooved roller support for a belt xerographic photoconductor. 4,447,144, Cl. 355-3.0BE.
Gilbertson, Thomas A. Air conditioning system and method. 4,446,703, Cl. 62-113.000.
Gilchrist, James E.: *See*—
Campbell, Jeptha E.; and Gilchrist, James E., 4,447,140, Cl. 350-534.000.
Gillett, Jimmie D.: *See*—
Evans, William E.; and Gillett, Jimmie D., 4,447,867, Cl. 363-56.000.
Gillette Company, The: *See*—
Jacobson, Chester F., 4,446,619, Cl. 30-85.000.
Gilman, David J.: *See*—
Yellin, Tobias O.; and Gilman, David J., 4,447,441, Cl. 424-269.000.
Gilman, John J., to Allied Corporation. Tetrahedral truss. 4,446,666, Cl. 52-648.000.
Gladstone Furnace Company, Inc.: *See*—
Becker, William M.; and Becker, William R., 4,446,848, Cl. 126-121.000.
Glaettli, Hans-Heinrich: *See*—
Stoll, Kurt; and Glaettli, Hans-Heinrich, 4,447,161, Cl. 368-65.000.
Glaxo Group Limited: *See*—
Collington, Eric W.; Finch, Harry; and Newton, Roger F., 4,447,428, Cl. 424-244.000.
GNS Gesellschaft fur Nuklear-Service mbH: *See*—
Baatz, Henning; Rittscher, Dieter; and Wriegt, Jurgen, 4,447,733, Cl. 250-506.100.
Goebel, Franz, to GTE Products Corporation. Electrochemical cell with two rate battery stacks. 4,447,504, Cl. 429-9.000.
Goekler, Robert G.: *See*—
Wheeler, Lionel H.; and Goekler, Robert G., 4,446,713, Cl. 72-308.000.
Gold, David: *See*—
Boyce, Arthur J.; and Gold, David, 4,447,752, Cl. 310-232.000.

Gold, Vance B.; Kubacki, Edward F.; and Krewenka, Thomas, to American Can Company. Closed loop control of continuous seam resistance heated forge welding cylinders. 4,447,699, Cl. 219-110.000.

Golda, Eugene: *See*—
Rowe, William; Golda, Eugene; and Wilkes, Alan, 4,447,512, Cl. 430-17.000.

Goldenberg, Marvin M., to Merck & Co., Inc. Anti-inflammatory/analgesic combination of α-fluoromethylhistidine and a selected non-steroidal anti-inflammatory drug (NSAID). 4,447,443, Cl. 424-273.00R.

Goldfarb, Louis; and Sweigart, Clyde M., to Armstrong World Industries, Inc. Heat storage system. 4,447,347, Cl. 252-70.000.

Goodenough, Samuel H.: *See*—
Meyer, Louis C.; and Goodenough, Samuel H., 4,446,577, Cl. 3-1.500.

Goodman, Howard M.; Shine, John; and Seeburg, Peter H., to University of California, Regents of the. Microorganism containing gene for human chorionic somatomammotropin. 4,447,538, Cl. 435-253.000.

Goodyear Tire & Rubber Company, The: *See*—
Parker, Dane K., 4,447,585, Cl. 525-359.700.
Parker, Dane K.; and Sabo, Timothy A., 4,447,667, Cl. 585-469.000.
Smith, Richard R.; and Kelley, Mellis M., 4,447,595, Cl. 528-274.000.

Gorring, Robert L.; and Smith, Robert L., to Mobil Oil Corporation. Deasphalting and hydrocracking. 4,447,313, Cl. 208-86.000.

Goscenski, Edward J., Jr., to Eaton Corporation. Hydraulic fan drive system including variable displacement pump. 4,446,697, Cl. 60-443.000.

Gosteli, Jacques; Ernest, Ivan; and Woodward, Robert B., to Ciba-Geigy Corporation. Intermediates for thia-aza compounds with a β-lactam ring. 4,447,360, Cl. 260-239.00A.

Goto, Jiro: *See*—
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, 4,447,429, Cl. 424-246.000.

Gottlob, Clifford E., to Gottlob Engine Conversions, Inc. Vibration damping base. 4,447,034, Cl. 248-634.000.

Gottlob Engine Conversions, Inc.: *See*—
Gottlob, Clifford E., 4,447,034, Cl. 248-634.000.

Gouin, Robert P. Folding rain gutter construction. 4,446,658, Cl. 52-11.000.

Gould, Inc.: *See*—
Beasley, J. Donald, 4,447,119, Cl. 350-96.180.
Putt, Ronald A.; and Attia, Alan I., 4,447,471, Cl. 427-98.000.

Gourlandt, Albert J. A. Method and an apparatus for automatically supporting and restraining birds, and preferably young chicks, said method and apparatus in a preferred embodiment being applied for automatically debeaking said birds. 4,446,819, Cl. 119-97.00R.

Govan, Donald T. Propellor protecting devices. 4,447,215, Cl. 440-71.000.

Gozzo, James J.: *See*—
DeFazio, Sally R.; Gozzo, James J.; and Monaco, Anthony P., 4,447,545, Cl. 436-518.000.

Graf, Martin J.: *See*—
Hetzel, Frederick; Graf, Martin J.; and Seredich, Douglas, 4,447,861, Cl. 362-216.000.

Graham Magnetics Incorporated: *See*—
Matheson, Neil, III, 4,447,274, Cl. 148-6.240.

Graham, William T.; and Wenkman, Gregory, to W. T. Rogers Co. Reticular needlework fabric. 4,447,483, Cl. 428-105.000.

Grantland, Gary; Montgomery, Hugh S.; Boeckmann, Eduard F. B.; and Woodworth, Larry A., to GTE Automatic Electric Inc. Electronic hold release circuit. 4,447,674, Cl. 179-81.00R.

Grapha-Holding AG: *See*—
Muller, Hans, 4,447,052, Cl. 271-280.000.

Graviner Limited: *See*—
Simpson, Colin A., 4,447,155, Cl. 356-437.000.

Gray, Herbert W.; and Payne, Roger A., to Gates Rubber Company, The. Method of producing a composite foam wire reinforced hose. 4,447,378, Cl. 264-45.900.

Gray, Sharon L., to Alford Industries, Inc. Hinged lid container having finished edges. 4,447,003, Cl. 229-44.0CB.

Gray, William P., to Racal-Mesl Microwave Limited. Rotary actuators. 4,447,793, Cl. 333-106.000.

Gray, William R.: *See*—
Olivera, Baldomero M.; Cruz, Lourdes J.; Gray, William R.; and Rivier, Jean E. F., 4,447,356, Cl. 260-112.50R.

Greaser, Randy A., to Sperry Corporation. Cam guide operating mechanism for roll baling machine. 4,446,786, Cl. 100-88.000.

Green, Philip S.: *See*—
Wilson, David A.; Buxton, James L.; and Green, Philip S., 4,446,740, Cl. 73-626.000.

Green, William M. Trousers having modified pocket. 4,446,573, Cl. 2-252.000.

Greenquist, Alfred C.; Rupchock, Patricia A.; Tyhach, Richard J.; and Walter, Bert, to Miles Laboratories, Inc. Preparing homogeneous specific binding assay element to avoid premature reaction. 4,447,529, Cl. 435-7.000.

Gregory, David L.: *See*—
Blough, LeVone A.; and Gregory, David L., 4,446,763, Cl. 81-90.00B.
Blough, LeVone A.; and Gregory, David L., 4,447,176, Cl. 408-72.00R.

Grender, Arnemann; and Johnson, George F., Jr. Method and apparatus for accurately setting directional headings in mining tunnels. 4,446,626, Cl. 33-286.000.

Grever, Arnold J., to Selas Corporation of America. Inductive preheating of upset tubing. 4,447,690, Cl. 219-10.430.

Griffin, T. Scott: *See*—
Klayman, Daniel L.; Scovill, John P.; Bartosevich, Joseph F.; Mason, Carl J.; and Griffin, T. Scott, 4,447,427, Cl. 424-244.000.

Grigoleit Company, The: *See*—
Howie, Robert K., Jr., 4,446,811, Cl. 116-309.000.

Grigorenko, Donald C. Hand-held barbecue spit. 4,446,777, Cl. 99-419.000.

Griman, George A.: *See*—
Schoolman, William K.; Griman, George A.; and Andrews, Frank D., 4,446,654, Cl. 49-181.000.

Grimmer, Rudolf, to Siemens Aktiengesellschaft. Reactive resin compositions and molded substances made therefrom. 4,447,564, Cl. 523-200.000.

Grisar, J. Martin; Schnettler, Richard A.; and Dage, Richard C., to Merrell Dow Pharmaceuticals Inc. 4-Alkanoylimidazol-2-ones. 4,447,619, Cl. 548-318.000.

Groch, Mark W.; and Domnanovich, James R., to Siemens Gammasonics, Inc. Method and apparatus for detecting heart sounds. 4,446,873, Cl. 128-715.000.

Grondalski, David, to Data General Corporation. Memory bus interface system. 4,447,877, Cl. 364-200.000.

Gros, Harold J., to Copolymer Rubber & Chemical Corporation. Method of processing low molecular weight EPM and EPDM polymers. 4,447,582, Cl. 525-279.000.

Grose, Ronald D., to InterNorth, Inc. Plastic radiant exchanger. 4,446,851, Cl. 126-449.000.

Groth, Edward J., Jr.: *See*—
Bjornholt, John E.; Foster, Richard G.; and Groth, Edward J., Jr., 4,447,907, Cl. 375-1.000.

Grumman Aerospace Corporation: *See*—
Leib, Kenneth G., 4,447,111, Cl. 350-3.700.

Grundfos A/S: *See*—
Jensen, Niels D.; and Nielsen, Kurt F., 4,447,189, Cl. 415-168.000.

Grundler, Bruno, to SIG-Schweizerische Industrie-Gesellschaft. Bag handling apparatus for a bag making machine. 4,446,676, Cl. 53-552.000.

Grunzweig & Hartmann und Glasfaser AG: *See*—
Kummermehr, Hans; and Sommer, Rolf, 4,447,345, Cl. 252-62.000.

GTE Automatic Electric Inc.: *See*—
Grantland, Gary; Montgomery, Hugh S.; Boeckmann, Eduard F. B.; and Woodworth, Larry A., 4,447,674, Cl. 179-81.00R.

GTE Laboratories Incorporated: *See*—
LaPotin, David P., 4,447,747, Cl. 307-529.000.
Sarin, Vinod K.; and Oberhauser, Peter, 4,446,936, Cl. 175-410.000.

GTE Products Corporation: *See*—
Goebel, Franz, 4,447,504, Cl. 429-9.000.
Mizuhara, Howard, 4,447,391, Cl. 420-456.000.
Mizuhara, Howard, 4,447,392, Cl. 420-501.000.
Vanderpool, Clarence D.; and MacInnis, Martin B., 4,447,404, Cl. 423-61.000.

Guazzo, Lucien; and Trezeguet, Jean-Pierre, to Les Cables de Lyon. Multiple connection for an undersea cable system. 4,447,115, Cl. 350-96.200.

Gudgeon, Ronald L.: *See*—
Renfro, Vernon E.; Gudgeon, Ronald L.; Clelland, John P.; and Cole, Clyde C., 4,447,186, Cl. 414-589.000.

Gueret, Jean-Louis H., to L'Oreal. Receptacle for make up powder. 4,446,879, Cl. 132-82.00B.

Gueret, Jean-Louis H.; and Arraudeau, Jean-Pierre, to L'Oreal. Make-up brush. 4,446,880, Cl. 132-88.500.

Gugliotti, Carmine, to Litton Systems, Inc. Connector with removable ejector latch. 4,447,101, Cl. 339-45.00M.

Guiler, Richard S., to E. J. Brooks Company. Meter clamping ring. 4,446,603, Cl. 24-21.000.

Guillaume, Jacques: *See*—
Ledelec, Lucien; Guillaume, Jacques; and Dumont, Claude, 4,447,438, Cl. 424-267.000.

Guinn, Kenneth F. Target game. 4,447,060, Cl. 273-346.000.

Gula, John A.; Brady, John D.; Thompson, Thomas C.; and Alt, Joyce M., to Quest Medical, Inc. Intravenous administration set assembly. 4,447,230, Cl. 604-122.000.

Gulf Oil Corporation: *See*—
Knepper, Jay C., 4,447,090, Cl. 299-2.000.

Gulf Research & Development Company: *See*—
Pretzer, Wayne R.; Kobylinski, Thaddeus P.; and Bozik, John E., 4,447,557, Cl. 502-161.000.

Gundel, Manfred; Schlamm, Heinz-Werner; and Schmitz, Klaus-Dieter, to Kabelwerke Reinshagen GmbH. Test circuit for electrical continuity of a load circuit. 4,447,806, Cl. 340-641.000.

Gunderson, Dennis E., to United States of America, Agriculture. Method and apparatus for edgewise compression testing of flat sheets. 4,446,743, Cl. 73-822.000.

Gunneman, Paul; and Jeuken, Gerardus W., to Ruti-Te Strake B.V. Method for transporting a weft thread through the weaving shed of a weaving machine through the intermediary of a flowing fluid, and weaving machine adapted for the application of this method. 4,446,893, Cl. 139-11.000.

Gurak, Ronald W.; and Diploma, Eduardo P., to Signode Corporation. Resilient chain strap wrapping and tensioning device. 4,446,784, Cl. 100-27.000.

Gustin, Pol A. G. J.: *See*—
Schayes, Raymond G. G.; Gustin, Pol A. G. J.; Bodart, Robert; and Berck, Michel F. D. J., 4,447,829, Cl. 358-260.000.
Gutnick, Morton. Devices and methods for the prevention of transmission of venereal disease and non-gonococcal genital infections. 4,446,860, Cl. 128-132.00R.
H. J. Heinz Company: *See*—
Coker, Lowell E.; and Venkatasubramanian, Kalyanasundram, 4,447,532, Cl. 435-99.000.
Haag, Donald L., to General Electric Company. Method of manufacturing a control device. 4,446,614, Cl. 29-622.000.
Haak, Peter A.: *See*—
Runnells, Robert R.; Haak, Peter A.; Larkin, Rodney B.; and Vandervelden, C. Keith, 4,447,399, Cl. 422-113.000.
Haase, James M.: *See*—
Bartley, Donald R.; and Haase, James M., 4,447,197, Cl. 425-28.00R.
Hackett, Peter A.: *See*—
Malatesta, Vincenzo; Willis, Clive; and Hackett, Peter A., 4,447,304, Cl. 204-157.10R.
Haendle, Joerg: *See*—
Alexandrescu, Mircea; and Haendle, Joerg, 4,447,827, Cl. 358-111.000.
Haendler & Natermann GmbH: *See*—
Sommerer, Klaus, 4,447,502, Cl. 428-571.000.
Hagan, Edward F.; and Reaver, Marvin G., Jr., to Du Pont de Nemours, E. I., and Company. Apparatus for mounting flexible printing plates. 4,446,625, Cl. 33-184.500.
Hagen, Gary P., to Standard Oil Company (Indiana). Process for preparation of alpha, beta-unsaturated esters using AMS-1B borosilicate crystalline molecular sieve. 4,447,641, Cl. 560-211.000.
Hagenmaier, Carl F., Jr.: *See*—
Bolton, Brent C.; Hagenmaier, Carl F., Jr.; Logsdon, Gary L.; and Miner, Robert L., Jr., 4,447,875, Cl. 364-200.000.
Haggard, Samuel E., to Mark Products, Inc. Apparatus for attaching a multiconductor cable to a housing. 4,447,104, Cl. 339-103.00M.
Hagin, Faust; and Drewitz, Hans J., to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Power divider gearbox with a planetary differential gear drive. 4,446,756, Cl. 74-687.000.
Hagiwara, Yukio: *See*—
Sugiyama, Takahiro; and Hagiwara, Yukio, 4,447,138, Cl. 350-472.000.
Hahn, Linus K., to Columbia Industries Corporation. Table top grill. 4,446,846, Cl. 126-25.00R.
Halkyard, Douglas R. Germicide sleeve for dental and medical instruments. 4,446,967, Cl. 206-368.000.
Hall, James D.: *See*—
Stone, Lyndon R.; and Hall, James D., 4,446,745, Cl. 73-862.250.
Hall, Kenneth R.: *See*—
Clingman, William H.; and Hall, Kenneth R., 4,446,748, Cl. 73-863.030.
Hall, Robert J.: *See*—
Allen, Roger A.; and Hall, Robert J., 4,447,708, Cl. 219-384.000.
Halley, Robert: *See*—
Nowell, Larry H.; and Halley, Robert, 4,446,624, Cl. 33-1.00C.
Halliburton Co.: *See*—
Borchardt, John K.; and Brown, David L., 4,447,342, Cl. 252-8.55D.
Halstead, Raymond T.: *See*—
Schaad, William J.; Black, Charles E., III; and Halstead, Raymond T., 4,447,688, Cl. 200-159.00R.
Hamana Iron Work Co., Ltd.: *See*—
Ueda, Iwao, 4,446,688, Cl. 57-58.650.
Hamid, Michael, to United States of America, Navy. Dielectric loaded horn antennas having improved radiation characteristics. 4,447,811, Cl. 343-783.000.
Hamisch, Hansjoachim: *See*—
Boruschewitz, Manfred; and Hamisch, Hansjoachim, 4,446,722, Cl. 73-35.000.
Hammer, Rudolf: *See*—
Trummlitz, Gunter; Engel, Wolfhard; Eberlein, Wolfgang; Schmidt, Gunther; Hammer, Rudolf; and del Soldato, Piero, 4,447,434, Cl. 424-256.000.
Hamon, Christian; Bandiera, Jean; and Senes, Michel, to Societe Chimique de la Grande Paroisse, Azote et Produits Chimiques. Production of hydrocarbons from methanol in the presence of zeolite catalysts. 4,447,669, Cl. 585-640.000.
Hampel, Klaus: *See*—
Nicolay, Karl; and Hampel, Klaus, 4,446,803, Cl. 112-320.000.
Hampton, William J.; James, Glenn R.; and Hatch, Raymond L. Flame combustion of carbonaceous fuels. 4,447,203, Cl. 431-3.000.
Hanaoka, Yuzuru; Murayama, Takeshi; and Muramoto, Setsuo, to Yokogawa Hokushin Electric Corporation. Multi-layer ion exchanger for use in ion-exchange chromatography and method of producing the same. 4,447,559, Cl. 521-28.000.
Haneda, Isamu, to Sharp Kabushiki Kaisha. Method for controlling display of output of a programmable device. 4,447,889, Cl. 364-900.000.
Hanel, Harold L.: *See*—
Benson, John; and Hanel, Harold L., 4,446,999, Cl. 227-11.000.
Hankosky, Andrew; and Clapper, Robert L., to Rockwell International Corporation. Force limiting device for an actuator rod. 4,447,036, Cl. 251-63.400.
Hann, Paul D.: *See*—
Casperson, John R.; and Hann, Paul D., 4,447,401, Cl. 422-151.000.
Hanna, Khalil. Intra-ocular implant. 4,446,582, Cl. 3-13.000.
Hansson, Manfred: *See*—
Sallnert, Kjell; Fridh, Carl-Erik; and Hansson, Manfred, 4,446,710, Cl. 72-10.000.
Harada, Hikaru; Akiyama, Teruo; and Hiyama, Tuneo, to Nippon Sanso K.K. Method for measuring volatile hydrides. 4,447,543, Cl. 436-72.000.
Harbauer, Werner; Drexler, Johann; and Flierl, Erwin, to Siemens Aktiengesellschaft. Air break contactor with form-fitted parts. 4,447,794, Cl. 335-128.000.
Hardin, Tommy G.; and Vrieland, Bruce C., to AT&T Technologies, Inc. Telecommunication cables. 4,446,689, Cl. 57-204.000.
Harding, Edward M., to Equipment Development Co. Self-contained gasoline driven portable masonry saw. 4,446,845, Cl. 125-13.0SS.
Harding, George W.; and Sears, Ronald E., to Sani-Jon Mfg., Inc. Portable toilet. 4,446,585, Cl. 4-460.000.
Hardt, Jean; and Widrig, Jakob, to Swiss Aluminium Ltd. Device for conducting away the exhaust gases from internal combustion engines. 4,446,942, Cl. 181-249.000.
Hardware Designers, Inc.: *See*—
Fielding, Brian S., 4,447,095, Cl. 308-3.800.
Hargreaves, Charles R.: *See*—
Price, Stephen J.; and Hargreaves, Charles R., 4,446,795, Cl. 102-527.000.
Harkins, Daniel J. Insulation system. 4,446,664, Cl. 52-404.000.
Harlan Material Handling Corporation: *See*—
Kaplan, James W., 4,447,071, Cl. 280-479.00R.
Harrap, Kenneth R.: *See*—
Jones, Terence R.; Harrap, Kenneth R.; and Calvert, Alan H., 4,447,608, Cl. 544-287.000.
Harrington, Joseph A.: *See*—
Simko, Aladar O.; Havstad, Peter H.; and Harrington, Joseph A., 4,446,830, Cl. 123-276.000.
Harris Corporation: *See*—
Smith, Earl F.; and McRae, Daniel D., 4,447,910, Cl. 375-99.000.
Harris, John F., Jr., to Du Pont de Nemours, E. I., and Company. Anisotropic melt polyesters of 6-hydroxy-2-naphthoic acid. 4,447,592, Cl. 528-128.000.
Harris, William J.; Jackson, Joseph M.; and Petty, David C., to Telelogic, Inc. Automatic dialer for telephone network access control. 4,447,676, Cl. 179-90.0BD.
Harrison, Anthony W., to Lucas Industries Limited. Solenoid-operated valve means for hydraulic systems. 4,446,882, Cl. 137-115.000.
Harrison, Peter; and Gaunt, Thomas N., to Plastona (John Waddington) Ltd. Plastics sheet material and articles produced therefrom. 4,447,479, Cl. 428-35.000.
Harshman, Daniel L.: *See*—
Sargisson, Donald F.; and Harshman, Daniel L., 4,446,696, Cl. 60-226.300.
Hartlapp, Jurgen: *See*—
Berthold, Joachim; Diedrich, Bernd; Franke, Rainer; Hartlapp, Jurgen; Schafer, Werner; and Strobel, Wolfgang, 4,447,587, Cl. 526-124.000.
Hartman, Adrian R.; Kohl, James E.; MacPherson, William F.; and Riley, Terence J., to Bell Telephone Laboratories, Incorporated. Control circuitry for high voltage solid-state switches. 4,447,744, Cl. 307-252.00R.
Hartwig, Carl S. M., to Institut Ceirac S.A. Washing machine. 4,446,706, Cl. 68-24.000.
Harwell, Jack B., to Teccor Electronics, Inc. Electromagnetic control circuit. 4,447,849, Cl. 361-152.000.
Hasegawa, Shin, to United States of America, Agriculture. Strain of *Corynebacterium Fascians* and use thereof to reduce limonoid bitterness in citrus products. 4,447,456, Cl. 426-51.000.
Hashimoto, Mayuki: *See*—
Kimura, Etsuji; Ogi, Katsumi; Sato, Kazusuke; and Hashimoto, Mayuki, 4,447,045, Cl. 266-149.000.
Hashimoto, Shigeyoshi: *See*—
Suzuki, Haruo; and Hashimoto, Shigeyoshi, 4,446,907, Cl. 164-120.000.
Hasse, Werner: *See*—
Kern, Bernd M.; and Hasse, Werner, 4,447,211, Cl. 434-12.000.
Hata, Shun-ichi: *See*—
Tanemura, Mitsura; Yamazaki, Tamotsu; Mizuno, Koji; Kaiho, Shin-ichi; Kakimoto, Morio; Hoshino, Eiichi; Matsunaga, Isao; and Hata, Shun-ichi, 4,447,453, Cl. 424-319.000.
Hatch, Raymond L.: *See*—
Hampton, William J.; James, Glenn R.; and Hatch, Raymond L., 4,447,203, Cl. 431-3.000.
Hatzis, Van, to Pitney Bowes Inc. Edge printing device. 4,447,148, Cl. 355-75.000.
Hauserman Ltd.: *See*—
Stumpf, William S.; and Ludwig, Gary R., 4,446,663, Cl. 52-144.000.
Havstad, Peter H.: *See*—
Simko, Aladar O.; Havstad, Peter H.; and Harrington, Joseph A., 4,446,830, Cl. 123-276.000.
Hawera Probst GmbH & Co.: *See*—
Muller, Norbert, 4,446,934, Cl. 175-286.000.
Hawkins, Harry M.: *See*—
Swift, John N.; and Hawkins, Harry M., 4,447,212, Cl. 434-185.000.
Hayami, Ryozo: *See*—
Ebata, Yoshihiro; Kose, Saburo; and Hayami, Ryozo, 4,447,283, Cl. 156-325.000.
Hayashi, Hiroshi: *See*—
Sakamoto, Hajimu; Kiyota, Takao; and Hayashi, Hiroshi, 4,447,355, Cl. 260-112.00B.

Hayashikane Shipbuilding & Engineering Co., Ltd.: *See*—
Tada, Yoshikazu, 4,446,861, Cl. 128-139.000.
Hayden, Donald W., Jr. Ice-creeper type overshoe. 4,446,635, Cl. 36-116.000.
Hayes, Claude Q. C. Heat-absorbing heat sink. 4,446,916, Cl. 165-185.000.
Hayes, John C.; and Castillo, Carmen, to UOP Inc. Passivation of metal contaminants on cracking catalyst. 4,447,552, Cl. 502-41.000.
Hayes, John K.: *See*—
Jensen, Reed J.; Thorne, James M.; Cluff, Coran L.; and Hayes, John K., 4,447,303, Cl. 204-157.10R.
Hayslett, David D.: *See*—
Schwartz, Henry D.; Krull, Irwin H.; Clement, Carl P.; Stengel, Frederick H.; and Hayslett, David D., 4,447,398, Cl. 422-102.000.
HB Megaron: *See*—
Lovgren, Anders, 4,446,800, Cl. 110-270.000.
Hearn, Dennis: *See*—
Smith, Lawrence A., Jr.; Jones, Edward M., Jr.; and Hearn, Dennis, 4,447,668, Cl. 585-639.000.
Heck, Louis J. Wave responsive generator. 4,447,740, Cl. 290-53.000.
Heckingbottom, Roger: *See*—
Davies, Graham J.; Heckingbottom, Roger; and Andrews, David A., 4,447,276, Cl. 148-175.000.
Heidrich, Paul F.; Laff, Robert A.; and Light, Thomas B., to International Business Machines Corporation. Uniformly intense imaging by close-packed lens array. 4,447,126, Cl. 350-96.310.
Heilmann, Steven M.: *See*—
Driscoll, William A.; Heilmann, Steven M.; and Rasmussen, Jerald K., 4,447,493, Cl. 428-332.000.
Heilos, Johannes: *See*—
Beschke, Helmut; Friedrich, Heinz; and Heilos, Johannes, 4,447,612, Cl. 546-285.000.
Hein, Carl C.: *See*—
Wagner, John R., Jr.; and Hein, Carl C., 4,447,494, Cl. 428-349.000.
Heindl, Rudolf; and Robert, Andre, to Commissariat a l'Energie Atomique; and Centre National de la Recherche Scientifique. Process for obtaining luminescent glass layers. 4,447,305, Cl. 204-192.00C.
Heinemann, Stanley O., to Bentley Laboratories. Apparatus and method for measuring blood oxygen saturation. 4,447,150, Cl. 356-41.000.
Heinrichs, Frank W., to McGraw-Edison Company. Self-adjusting spacer. 4,447,796, Cl. 336-60.000.
Heinzelman, Bert D.; Spranger, Douglas M.; Brookes, Malcolm J.; and Kuphal, John E., to Shur Medical Corporation. Wound closure tape and applicator therefor. 4,447,482, Cl. 428-42.000.
Heitmann, Knut; and Schaefer, Klaus-Dieter, to Ernst Leitz Wetzlar GmbH. Reflex camera with electronic range finder. 4,447,143, Cl. 354-407.000.
Heliotronic Forschungs-und Entwicklungsgesellschaft fur Solarzellen-Grundstoffe mbH: *See*—
Geissler, Joachim; and Helmreich, Dieter, 4,447,289, Cl. 156-608.000.
Helix Technology Corporation: *See*—
Peterson, John F.; and Bartlett, Allen J., 4,446,702, Cl. 62-55.500.
Helle, Michel: *See*—
Desserre, Jacques; and Helle, Michel, 4,447,839, Cl. 360-113.000.
Heller, Rudolf; and Kahn, Iwan, to Contraves AG. Radar reflector for an artillery shell. 4,446,792, Cl. 102-473.000.
Helmes Machinefabriek B.V.: *See*—
Luyten, Jacobus H., 4,446,899, Cl. 144-201.000.
Helmreich, Dieter: *See*—
Geissler, Joachim; and Helmreich, Dieter, 4,447,289, Cl. 156-608.000.
Helser, Jerry L.: *See*—
Shannon, Richard F.; and Helser, Jerry L., 4,447,380, Cl. 264-82.000.
Hemmer, Clemens J. Chain security device. 4,447,080, Cl. 292-264.000.
Henderson, Alfred J., Jr.: *See*—
VanHorn, David D.; Putz, John M.; and Henderson, Alfred J., Jr., 4,447,865, Cl. 362-305.000.
Hendrix, James E.; and Payet, George L., to Springs Industries, Inc. Oxidative afterwash treatment for crease resisting fabrics. 4,447,241, Cl. 8-116.400.
Henne, Andreas; Hesse, Anton; Jacobi, Manfred; Schornick, Gunnar; Vyvial, Rudolf; and Holoch, Klaus, to BASF Aktiengesellschaft. Acylphosphine oxides and their use. 4,447,520, Cl. 430-281.000.
Henny Penny Corporation: *See*—
Puvogel, Timothy J.; King, James D.; and Moore, David O., 4,446,780, Cl. 99-480.000.
Henrich, Donald A., to Outboard Marine Corporation. Anti-ventilation means for marine gear case. 4,447,214, Cl. 440-66.000.
Henrichs, Paul: *See*—
Hoppe, Hans-Georg; and Henrichs, Paul, 4,447,486, Cl. 428-318.600.
Henrick, Clive A., to Zoecon Corporation. Pyridyl esters and thiolesters of aminoalkanoic acids. 4,447,613, Cl. 546-300.000.
Henry, Dale V.: *See*—
Faulkner, Richard D.; Henry, Dale V.; and Muth, David L., 4,447,758, Cl. 313-532.000.
Heraeus Quarzschmelze GmbH: *See*—
Christiansen, Uwe; Rau, Karlheinz; Steinkohl, Anton; and Streb, Bruno, 4,447,130, Cl. 350-310.000.
Hercules, Incorporated: *See*—
Engle, Edward J., III, 4,447,495, Cl. 428-429.000.
Herder, N.V.: *See*—
Perl, Ludovic; and Szabo, Bill, 4,447,096, Cl. 312-111.000.
Heredia de la Paz, Jorge A.; and Sanchez, David F., to Vitro-Tec Fideicomiso. Solenoid actuated valve block for glassware forming machines. 4,446,888, Cl. 137-596.170.
Hershman, Haim: *See*—
Bronicki, Lucien Y.; Hershman, Haim; and Lehmann, Gerard, 4,446,700, Cl. 60-641.800.
Hertel, Robert C., to Ruskin Manufacturing Company. Damper frame construction. 4,446,667, Cl. 52-658.000.
Herzog, Rudolf, to Suzer Brothers Ltd. Control circuit with an auxiliary process variable. 4,447,869, Cl. 364-184.000.
Hess, Peter A.: *See*—
Dohse, Jerry L.; and Hess, Peter A., 4,446,957, Cl. 194-54.000.
Hesse, Anton: *See*—
Henne, Andreas; Hesse, Anton; Jacobi, Manfred; Schornick, Gunnar; Vyvial, Rudolf; and Holoch, Klaus, 4,447,520, Cl. 430-281.000.
Hetzel, Frederick; Graf, Martin J.; and Seredich, Douglas, to General Electric Company. Circular fluorescent lamp unit. 4,447,861, Cl. 362-216.000.
Heurtey, Stein: *See*—
Wang, Robert, 4,446,812, Cl. 118-63.000.
Hidaka, Tsuneo; Inoue, Masahide; and Ogiso, Makoto, to Asahi Kogaku Kogyo Kabushiki Kaisha. Upper structure for artificial apatite dental root. 4,447,210, Cl. 433-173.000.
Higashiguchi, Teruaki: *See*—
Miyakawa, Nobuhiro; Higashiguchi, Teruaki; Sano, Yumiko; and Funato, Masatomi, 4,447,513, Cl. 430-58.000.
Higbee, Wallace C., to Firestone Tire & Rubber Company, The. Toggle type web lock. 4,447,018, Cl. 242-107.200.
Hilbrans, Hermann; and Rao, Chatty, to Klockner-Humboldt-Deutz AG. Method for separating non-ferrous metals from iron-containing materials. 4,447,261, Cl. 75-5.000.
Hill, Ira D.: *See*—
Spitz, Seymour J., Jr.; Mookherjee, Braja D.; Hill, Ira D.; Keleher, Lloyd F.; Trenkle, Robert W.; and Wolff, Robin K., 4,446,651, Cl. 47-10.000.
Himberg, Elliot. Convertible camera-supporting belt device. 4,446,997, Cl. 224-151.000.
Hinze, Klaus: *See*—
Fieber, Werner H.; Hinze, Klaus; Huth, Manfred K. O.; Jost, Hans-Georg; Lamm, Klaus D.; Michalski, Dieter; and Rittaler, Konstantin, 4,447,686, Cl. 200-153.00J.
Hipp, James, to Petro-Drive, Inc. Hydrostatic shear pin. 4,446,932, Cl. 175-74.000.
Hirabayashi, Masaya: *See*—
Inamori, Kazuo; and Hirabayashi, Masaya, 4,446,579, Cl. 3-1.910.
Hirano, Shigeo; and Takagi, Yoshihiro, to Fuji Photo Film Co., Ltd. Method of forming a photographic image. 4,447,522, Cl. 430-405.000.
Hirano, Tooichiro: *See*—
Takeo, Kimihiko; Hirano, Tooichiro; and Sato, Fumihiko, 4,447,601, Cl. 536-102.000.
Hiraoka, Takeshi; Urano, Shigeru; and Yamamoto, Kiyoshi, to Nippon Piston Ring Co., Ltd. Cylinder liner. 4,447,275, Cl. 148-152.000.
Hirata, Noritsugu; Takimoto, Hiroyuki; and Maeda, Masaya, to Canon Kabushiki Kaisha. Video recording system. 4,447,837, Cl. 360-33.100.
Hirose, Noboru: *See*—
Aoshima, Shozo; Hirose, Noboru; and Ishikawa, Michio, 4,446,746, Cl. 73-862.330.
Hirschberg, Jakub: *See*—
Wager, Mats; and Hirschberg, Jakub, 4,447,053, Cl. 271-113.000.
Hirschfeld, Tomas E., to Block, Myron J. Fluorescent immunoassay employing optical fiber in capillary tube. 4,447,546, Cl. 436-527.000.
Hisataka, Masauki. Safe guard protective equipment for fighting art. 4,446,576, Cl. 2-425.000.
Hitachi Chemical Company, Ltd.: *See*—
Makino, Daisuke; and Miyadera, Yasuo, 4,447,596, Cl. 528-353.000.
Nishizawa, Hiroshi; Mukoyama, Yoshiyuki; and Kasai, Shozo, 4,447,589, Cl. 528-45.000.
Hitachi Denshi Kabushiki Kaisha: *See*—
Kodama, Kazuyuki; Endo, Takeyuki; Okada, Kunihiro; and Shibuya, Yasutaka, 4,447,809, Cl. 340-747.000.
Hitachi Lighting, Ltd.: *See*—
Iyama, Hiroyuki; and Watanabe, Yoshio, 4,447,763, Cl. 315-207.000.
Hitachi, Ltd.: *See*—
Ishikawa, Isao; Kanda, Hiroshi; and Katakura, Kageyoshi, 4,446,738, Cl. 73-606.000.
Kimura, Katsuhiro; Endo, Akira; and Takezaki, Jiro, 4,446,826, Cl. 123-143.00B.
Kodama, Kazuyuki; Endo, Takeyuki; Okada, Kunihiro; and Shibuya, Yasutaka, 4,447,809, Cl. 340-747.000.
Kojima, Takafumi; Yoshida, Shigeru; and Mizoguchi, Masayuki, 4,447,679, Cl. 179-175.30R.
Kuni, Asahiro; Kembo, Yukio; Akiyama, Nobuyuki; and Aoki, Nobuhiko, 4,447,731, Cl. 250-442.100.
Terada, Matsuaki; and Yokota, Koji, 4,447,871, Cl. 364-200.000.
Watanabe, Syuji; Ishii, Yoshitaro; and Sunagawa, Masao, 4,446,594, Cl. 15-323.000.
Hitachi Maxell, Ltd.: *See*—
Toi, Mitsuharu; and Takagi, Hiroyoshi, 4,447,020, Cl. 242-198.000.
Hitachi Metals, Ltd.: *See*—
Inoue, Akira, 4,447,070, Cl. 280-434.000.
Hitzman, Donald O., to Phillips Petroleum Company. Enhanced oil recovery using microorganisms. 4,446,919, Cl. 166-246.000.

Hiyama, Tuneo: *See*—
Harada, Hikaru; Akiyama, Teruo; and Hiyama, Tuneo, 4,447,543, Cl. 436-72.000.
Hjorring, Hans, to Siemens Aktiengesellschaft. Circuit for rapid recognition of FSK signals in a radio channel. 4,447,909, Cl. 375-88.000.
Ho, Andrew W., to Chevron Research Company. 2,2-Bis(haloalkenyl)-1-cyano-1-alkoxycarbonylethylene fungicides. 4,447,450, Cl. 424-304.000.
Hoaglen, Milford D. Multiple unit agricultural device and transport system therefor. 4,446,926, Cl. 172-240.000.
Hobart, Floyd E., Jr., to Western Electric Company, Inc. Connector pin. 4,447,109, Cl. 339-256.00R.
Hockenberry, Richard L., to Deere & Company. Apparatus and method for measuring the filterability of a fluid at low temperatures. 4,446,726, Cl. 73-61.400.
Hocker, Jurgen; Dhein, Rolf; and Merten, Rudolf, to Bayer Aktiengesellschaft. Oxidized polyacetylene and a process for the preparation thereof. 4,447,583, Cl. 525-328.100.
Hoechst Aktiengesellschaft: *See*—
Berthold, Joachim; Diedrich, Bernd; Franke, Rainer; Hartlapp, Jurgen; Schafer, Werner; and Strobel, Wolfgang, 4,447,587, Cl. 526-124.000.
Frass, Werner; and Horn, Klaus, 4,447,510, Cl. 430-3.000.
Martini, Thomas; Schinzel, Erich; Frischkorn, Hans; Friedrich, Herbert; and Probst, Heinz, 4,447,350, Cl. 252-301.220.
May, Adolf; and Bucking, Hans-Walter, 4,447,343, Cl. 252-8.750.
Stahler, Gerhard; and Waltersdorfer, Anna, 4,447,444, Cl. 424-273.00P.
Stephan, Hans-Werner; Klein, Hermann; and Lehr, Klaus, 4,447,400, Cl. 422-150.000.
Hofbauer, John, to Die-Craft Metal Products, Inc. Component retaping machine. 4,447,287, Cl. 156-552.000.
Hoffmann, Alvin R.: *See*—
Farag, Samir F.; Hoffmann, Alvin R.; and Kleinecke, John D., 4,447,858, Cl. 361-429.000.
Hoffmann-La Roche Inc.: *See*—
Breuninger, Manfred W., 4,447,649, Cl. 568-484.000.
Liu, Chao-Min; Tresner, Homer D.; and Westley, John, 4,447,533, Cl. 435-119.000.
Hofmann, Hans P.: *See*—
Steiner, Gerd; Hofmann, Hans P.; Kreiskott, Horst; Teschendorf, Hans-Juergen; and Lenke, Dieter, 4,447,610, Cl. 544-381.000.
Hokko Chemical Industry Co., Ltd.: *See*—
Ohyama, Hiroshi; Takada, Sanae; Morita, Ken; and Yamamura, Saburo, 4,447,259, Cl. 71-94.000.
Holik, Herbert: *See*—
Bubik, Alfred; Dahl, Hans; Holik, Herbert; Kurtz, Rudiger; and Seider, Werner, 4,447,295, Cl. 162-300.000.
Holl & CIE GmbH: *See*—
Betschler, Joachim, 4,447,298, Cl. 204-23.000.
Hollandse Signaalapparaten B.V.: *See*—
Koene, Johan W., 4,447,114, Cl. 350-96.200.
Hollosy, to Generalimpex Kulkereskedelmi Vallalat. Toy with balls. 4,447,057, Cl. 273-116.000.
Holmberg, Albert E.; and Holmberg, Thomas A., to Holmberg Company, The. Paper sheets having recessed pressure-sensitive glued edge with a removable strip. 4,447,481, Cl. 428-40.000.
Holmberg Company, The: *See*—
Holmberg, Albert E.; and Holmberg, Thomas A., 4,447,481, Cl. 428-40.000.
Holmberg, Thomas A.: *See*—
Holmberg, Albert E.; and Holmberg, Thomas A., 4,447,481, Cl. 428-40.000.
Holmes, Brian N.: *See*—
Tiers, George V. D.; Aasen, Steven M.; Dalzell, Rex J.; and Holmes, Brian N., 4,447,521, Cl. 430-337.000.
Holmes, Ralph. Connection assembly for use with an articulated linkage system. 4,447,170, Cl. 403-64.000.
Holoch, Klaus: *See*—
Henne, Andreas; Hesse, Anton; Jacobi, Manfred; Schornick, Gunnar; Vyvial, Rudolf; and Holoch, Klaus, 4,447,520, Cl. 430-281.000.
Holt, Luther D., to Barni, John J. SCR Motor speed control. 4,447,767, Cl. 318-139.000.
Holzle, Gerd; and Begrich, Rainer, to Ciba-Geigy Corporation. Fibre-reactive azo dyestuffs containing a halotriazinyl radical and a non-reactive triazinyl radical. 4,447,357, Cl. 260-153.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Kurihara, Norimitsu; and Imai, Takeshi, 4,446,727, Cl. 73-113.000.
Honda, Hideyuki: *See*—
Omae, Yoshihiro; Okubo, Noboru; Sigyo, Keiichi; Nakajima, Hideo; Fukui, Hiroaki; Yamada, Toshio; and Honda, Hideyuki, 4,447,805, Cl. 340-539.000.
Honeywell Inc.: *See*—
Gelinas, Raymond C., 4,447,779, Cl. 324-207.000.
Price, Stephen J.; and Hargreaves, Charles R., 4,446,795, Cl. 102-527.000.
van Dyke, Martin J., 4,447,781, Cl. 324-83.00A.
Honeywell Information Systems Inc.: *See*—
Tague, Steven A.; and Negi, Virendra S., 4,447,870, Cl. 364-200.000.
Hong, Leon: *See*—
Balboni, John J.; and Hong, Leon, 4,447,459, Cl. 426-441.000.
Hooley, Eldon R.; and Dodge, David L. Machine for stripping meat from fowl leg and thigh bones. 4,446,600, Cl. 17-11.000.
Hoppe, Hans-Georg; and Henrichs, Paul, to Bayer Aktiengesellschaft. Surface-sealed moldings of cellular polyurethane elastomers and a process for their production. 4,447,486, Cl. 428-318.600.
Horibe, Michiharu: *See*—
Takagi, Yasuo; and Horibe, Michiharu, 4,447,579, Cl. 525-113.000.
Horii, Kenju, to Matsushita Electric Industrial Co., Ltd. Charge-coupled type solid-state image sensor. 4,447,735, Cl. 250-578.000.
Horii, Masami: *See*—
Ochiai, Kuniaki; Horii, Masami; and Norigoe, Takashi, 4,447,166, Cl. 400-124.000.
Horing, Eckart: *See*—
Kersten, Peter; Meixner, Peter; Muller, Erich; and Horing, Eckart, 4,447,165, Cl. 384-428.000.
Horlbeck, Gernot; and Feldmann, Rainer, to Chemische Werke Huels AG. Textile hot-melt adhesive. 4,447,573, Cl. 524-394.000.
Horn, Klaus: *See*—
Frass, Werner; and Horn, Klaus, 4,447,510, Cl. 430-3.000.
Horn, Peter; Gehm, Robert; Marx, Matthias; and Roeber, Artur, to BASF Aktiengesellschaft. Stable water glass solutions, process for their preparation and use for organosilicate foams as well as a production process therefor. 4,447,561, Cl. 521-118.000.
Horwath, Robert O.; and Irbe, Robert M., to Nabisco Brands, Inc. Glucose isomerase from fungi of the basidiomycetes class. 4,447,531, Cl. 435-94.000.
Hosel, Fritz P.: *See*—
Marx, Hans-Jurgen; and Hosel, Fritz P., 4,446,602, Cl. 19-0.210.
Hoshino, Eiichi: *See*—
Tanemura, Mitsura; Yamazaki, Tamotsu; Mizuno, Koji; Kaiho, Shin-ichi; Kakimoto, Morio; Hoshino, Eiichi; Matsunaga, Isao; and Hata, Shun-ichi, 4,447,453, Cl. 424-319.000.
Hoshiyama, Satoshi; Muto, Hiroyuki; Shinke, Shuzo; Otsuka, Kanji; Takigawa, Shinichiro; and Yamazaki, Hiroyuki, to Nissan Chemical Industries Ltd. Process for producing an alcohol by hydroformylation. 4,447,661, Cl. 568-882.000.
Hosoda, Kazuho: *See*—
Furuya, Koutaro; Hosoda, Kazuho; Takeuchi, Takahito; Ishikura, Yasuyuki; and Kameda, Morihiro, 4,446,580, Cl. 3-6.000.
Hottier, Francois, to U.S. Philips Corporation. Method and device for measuring objects using ultrasound echography. 4,446,737, Cl. 73-602.000.
Houck, Robert J.: *See*—
Klein, Richard G.; and Houck, Robert J., 4,447,807, Cl. 340-676.000.
Houle, Raymond T.: *See*—
Reed, Stewart D.; Sills, Arthur A.; Kraft, John H.; Houle, Raymond T.; Redwine, Michael A.; and Kilborn, Fredrick A., 4,446,586, Cl. 4-555.000.
House, Richard F.; and Kohler, Karl A., to Container Corporation of America. Carton handle arrangement. 4,447,004, Cl. 229-52.00B.
Housey, Lawrence J.: *See*—
Brantingham, George L.; Lou, Perry W.; Housey, Lawrence J.; Tubbs, Graham S.; and Teza, Jeffrey R., 4,447,881, Cl. 364-488.000.
Houtz, Timothy W.; and Jagen, Paul R., to Du Pont de Nemours, E. I., and Company. Panel mounted modular jack. 4,447,106, Cl. 339-126.00R.
Howard, Peter B.; and O'Donnell, Derek, to Tioxide Group PLC. Pigments and their preparation by coating with oxides of Zr-Si-Al. 4,447,270, Cl. 106-300.000.
Howard, Peter B.; and O'Donnell, Derek, to Tioxide Group PLC. Pigments and their preparation by coating with oxides of Si-Zr-Al. 4,447,271, Cl. 106-300.000.
Howard, Walter E.: *See*—
Teranishi, Roy; Murphy, Edwin L.; Balser, Donald S.; and Howard, Walter E., 4,446,648, Cl. 43-131.000.
Howe, Dennis G.: *See*—
Geyer, Frederick F.; and Howe, Dennis G., 4,447,899, Cl. 369-111.000.
Howie, Robert K., Jr., to Grigoleit Company, The. Knob and skirt assembly. 4,446,811, Cl. 116-309.000.
Howlett, James F.; and Thompson, Marlin H., to International Scientific Industries, Inc. Electromagnetic device construction. 4,447,750, Cl. 310-89.000.
Howmet Turbine Components Corporation: *See*—
Dardi, Louis E.; and Shankar, Srinivasan, 4,447,503, Cl. 428-632.000.
Hreschak, Bohdan O.; and Hreschak, Christine. Composition, method of preparation thereof, method of application, apparatus for the control of larvae of the Gypsy Moth and other hardwood defoliators. 4,447,447, Cl. 424-285.000.
Hreschak, Christine: *See*—
Hreschak, Bohdan O.; and Hreschak, Christine, 4,447,447, Cl. 424-285.000.
Hruska, Louis W.; and Tsai, Shan-Pu, to Eltech Systems Corp. Modified liquid permeable asbestos diaphragms with improved dimensional stability. 4,447,566, Cl. 523-221.000.
Hubbard, Raymond W.; Seiffhart, John B.; and Hubbard, Thomas. Meat processor. 4,446,779, Cl. 99-472.000.
Hubbard, Thomas: *See*—
Hubbard, Raymond W.; Seiffhart, John B.; and Hubbard, Thomas, 4,446,779, Cl. 99-472.000.
Huebsch, Monte F., III. High porosity ceramic materials and method for making same. 4,447,548, Cl. 501-85.000.
Huetter, Horst: *See*—
Bock, Siegfried; and Huetter, Horst, 4,447,025, Cl. 244-118.200.

Huey, Wai J.; Murman, Fernando; and Matsuda, Eugene, to Hydril Company. Well blowout preventer, and packing element. 4,447,037, Cl. 251-1.00B.

Hughes Aircraft Company: *See—*
Ferrer, John J., 4,447,128, Cl. 350-174.000.
Peters, John W., 4,447,469, Cl. 427-54.100.

Hughes, Alan C.; Copeman, Richard C.; and Marples, Thomas N. R., to McKenchnie Chemicals Limited. Controlled release of trace elements. 4,447,254, Cl. 71-67.000.

Humphries, Martin E., to British Aerospace Public Limited Company. Telescopic variable length device. 4,446,662, Cl. 52-121.000.

Hung, William M.; and Ehlinger, Edward E., to Sterling Drug Inc. Pyridine containing benzoic acid derivatives. 4,447,616, Cl. 546-335.000.

Huth, Manfred K. O.: *See—*
Fieber, Werner H.; Hinze, Klaus; Huth, Manfred K. O.; Jost, Hans-Georg; Lamm, Klaus D.; Michalski, Dieter; and Rittaler, Konstantin, 4,447,686, Cl. 200-153.00J.

Hydril Company: *See—*
Huey, Wai J.; Murman, Fernando; and Matsuda, Eugene, 4,447,037, Cl. 251-1.00B.

Iacoviello, John G.: *See—*
Cook, Gerald R.; Iacoviello, John G.; Pinschmidt, Robert K., Jr.; and Davidowich, George, 4,447,570, Cl. 524-127.000.

Ichiijo, Chikara: *See—*
Fukayama, Miyoji; and Ichiijo, Chikara, 4,447,576, Cl. 524-714.000.

ICI Australia Limited: *See—*
Lubbock, Frederick J.; Mok, Christopher C. K.; and Eldridge, Robert J., 4,447,475, Cl. 427-213.310.

Ideguchi, Satoshi: *See—*
Watanabe, Kiyoshi; Ideguchi, Satoshi; Ogura, Masahiro; Shimada, Masahiko; and Kawaharada, Hajime, 4,447,362, Cl. 260-396.00R.

Idriss, Samir F.: *See—*
DeCant, Leonard J., Jr.; Idriss, Samir F.; and Prosl, Frank R., 4,447,224, Cl. 604-67.000.

Igashira, Toshihiko: *See—*
Sekiguchi, Kiyonori; Igashira, Toshihiko; Tanaka, Takeshi; Kawai, Hisasi; Yamada, Mitsumasa; Kawagoe, Michio; and Tanaka, Masaaki, 4,446,839, Cl. 123-569.000.

Iijima, Hitoshi: *See—*
Yamazaki, Kisuke; Iijima, Hitoshi; Matsuoka, Fumio; and Nishizawa, Toshizo, 4,446,704, Cl. 62-180.000.

Iizuka, Sadao: *See—*
Suzuki, Shintaro; Iizuka, Sadao; and Moriya, Yoshimi, 4,447,264, Cl. 75-251.000.

Ikai, Takashi: *See—*
Suzuki, Fumio; Fujikawa, Yoshihiro; Yamamoto, Susumu; Mizutani, Hidemi; Ohya, Tunehiko; Ikai, Takashi; and Oguchi, Toshihiko, 4,447,256, Cl. 71-86.000.

Ikegai Tekko Kabushiki Kaisha: *See—*
Asano, Toshitake, 4,447,181, Cl. 409-345.000.

Ilardo, Charles S.: *See—*
Scharf, Daniel J.; Ilardo, Charles S.; Schwartz, Willis T.; and Salee, Gideon, 4,447,572, Cl. 524-371.000.

Illinois Tool Works Inc.: *See—*
Ruehl, William E., 4,447,105, Cl. 339-113.00R.

Illy, Pierre, to Deere & Company. Cylindrical baler twine wrapping apparatus for wrapping bale with two pieces of twine. 4,446,783, Cl. 100-5.000.

Imai, Takeshi: *See—*
Kurihara, Norimitsu; and Imai, Takeshi, 4,446,727, Cl. 73-113.000.

Imai, Tomoyasu: *See—*
Asaeda, Toshio; Suzuki, Ikuo; Imai, Tomoyasu; and Kitajima, Masato, 4,446,657, Cl. 51-206.00R.

Imamura, Yoichi, to Kabushiki Kaisha Suwa Seikosha. Semiconductor memory device. 4,447,894, Cl. 365-219.000.

Imazeki, Ryoji; and Inoue, Michiya, to Fujitsu Fanuc Limited. Method of rewriting data in non-volatile memory, and system therefor. 4,447,887, Cl. 364-900.000.

Imerman, Curtis E.; Langerud, David S.; and Thomas, Brian H., to FMC Corporation. Reversible outrigger crane support. 4,446,976, Cl. 212-189.000.

Imperial Chemical Industries Limited: *See—*
Simmons, Peter E., 4,447,851, Cl. 361-189.000.

Imperial Chemical Industries Plc: *See—*
Bradbury, John A.; Rowlands, Reuben; and Tipping, James W., 4,447,491, Cl. 428-304.400.
Cogswell, Frederic N.; and Tomka, Jiri G., 4,447,599, Cl. 528-502.000.
Jackson, Peter, 4,446,736, Cl. 73-600.000.
Kay, Ian T.; Bartholomew, David; Williams, Emyr G.; and Noon, Robert A., 4,447,446, Cl. 424-282.000.
Yellin, Tobias O.; and Gilman, David J., 4,447,441, Cl. 424-269.000.

Imura, Kenji, to Minolta Kabushiki Kaisha. Optical analyzer for measuring a construction ratio between components in the living tissue. 4,446,871, Cl. 128-633.000.

Inada, Junji, to Dai Nippon Insatsu Kabushiki Kaisha. Contamination-free apparatus for filling spouted bags with a fluid. 4,446,674, Cl. 53-502.000.

Inaga, Hisashi; and Yokocho, Yoetsu, to Kioritz Corporation. Heat insulating mounting device for carburetor. 4,446,822, Cl. 123-41.310.

Inamori, Kazuo; and Hirabayashi, Masaya, to Kyocera Corporation. Flexible ceramic bio-implant member. 4,446,579, Cl. 3-1.910.

Incom International Inc.: *See—*
Olsen, Roger F., 4,447,032, Cl. 248-558.000.

Indak Manufacturing Corp.: *See—*
Schaad, William J.; Black, Charles E., III; and Halstead, Raymond T., 4,447,688, Cl. 200-159.00R.

Infusaid Corporation: *See—*
DeCant, Leonard J., Jr.; Idriss, Samir F.; and Prosl, Frank R., 4,447,224, Cl. 604-67.000.

Ingersoll Equipment Co., Inc.: *See—*
Manteufel, Dale A., 4,446,898, Cl. 144-193.00A.

Inoue, Akira, to Hitachi Metals, Ltd. Fifth wheel. 4,447,070, Cl. 280-434.000.

Inoue, Haruhiko; Murasaki, Shun-ichi; and Naito, Masataka, to Nippondenso Co., Ltd. Humidity sensitive element. 4,447,352, Cl. 252-519.000.

Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi, 4,447,695, Cl. 219-69.00C.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Inverter-type power supply circuit for electrical machining. 4,447,695, Cl. 219-69.00C.

Inoue, Masahide: *See—*
Hidaka, Tsuneo; Inoue, Masahide; and Ogiso, Makoto, 4,447,210, Cl. 433-173.000.

Inoue, Michiya: *See—*
Imazeki, Ryoji; and Inoue, Michiya, 4,447,887, Cl. 364-900.000.

Inoue, Nobuyoshi: *See—*
Suzuki, Akira; Kaneko, Katumi; and Inoue, Nobuyoshi, 4,447,142, Cl. 354-246.000.

Institut Cerac S.A.: *See—*
Hartwig, Carl S. M., 4,446,706, Cl. 68-24.000.

Institut Dr. Friedrich Forster Prufgeratebau: *See—*
Stumm, Wolfgang, 4,447,778, Cl. 324-213.000.

Institut Straumann AG: *See—*
Sutter, Franz, 4,447,209, Cl. 433-173.000.

Institutul de Cercetarea Stiintifica si Inginerie Tehnologica Pentru Industria Electrotehnica: *See—*
Ghiurea, Florin C. V., 4,447,755, Cl. 310-329.000.

Instranetics, Inc.: *See—*
Eldridge, John D., Jr., 4,447,238, Cl. 604-280.000.

Instrumentation Laboratory Inc.: *See—*
Neri, Bruce P.; and Liffmann, Stanley M., 4,447,544, Cl. 436-105.000.

Intel Corporation: *See—*
Beinglass, Israel; and Tsai, Nan-Hsiung, 4,446,613, Cl. 29-571.000.
Kinnie, D. Craig; and Boberg, Richard W., 4,447,878, Cl. 364-200.000.
Matthews, James A., 4,447,290, Cl. 156-626.000.

INTERATOM Internationale Atomreaktorbau GmbH: *See—*
Jansing, Walter; and Vinzens, Kurt, 4,446,820, Cl. 122-32.000.

Interior Steel Equipment Co.: *See—*
French, Robert J.; and Dorony, Elmer F., 4,447,099, Cl. 312-257.00R.

International Business Machines Corporation: *See—*
Bergeron, David L.; and Patel, Parsotam T., 4,446,611, Cl. 29-578.000.
Chevillat, Pierre R.; and Ungerboeck, Gottfried, 4,447,908, Cl. 375-42.000.
Fang, Frank F.; and McGroddy, James C., 4,447,746, Cl. 307-311.000.
Fischer, Friedrich L., 4,447,048, Cl. 267-141.100.
Gibson, David K., 4,447,144, Cl. 355-3.0BE.
Heidrich, Paul F.; Laff, Robert A.; and Light, Thomas B., 4,447,126, Cl. 350-96.310.
Kuecker, Ward A.; Stratton, Susan D.; and Cason, William C., 4,447,888, Cl. 364-900.000.
Logan, Joseph S.; Mauer, John L., IV; Rothman, Laura B.; Schwartz, Geraldine C.; and Standley, Charles L., 4,447,824, Cl. 357-71.000.
Marks, Robert; Phelps, Douglas W., Jr.; and Ward, William C., 4,447,857, Cl. 361-395.000.
Mulzet, Alfred P., 4,447,221, Cl. 494-45.000.
Rainford, Robert E.; Moser, Mark M.; and Ojala, Jon R., 4,447,152, Cl. 356-237.000.
Stalberg, Nils G., 4,447,774, Cl. 328-150.000.

International Flavors & Fragrances Inc.: *See—*
Boden, Richard M.; Licciardello, Michael; and Tyszkiewicz, Theodore J., 4,447,365, Cl. 260-463.000.
Spitz, Seymour J., Jr.; Mookherjee, Braja D.; Hill, Ira D.; Keleher, Lloyd F.; Trenkle, Robert W.; and Wolff, Robin K., 4,446,651, Cl. 47-10.000.

International Food Equipment, Inc.: *See—*
Reed, Claude A., 4,446,775, Cl. 99-353.000.

International Harvester Co.: *See—*
Voss, Julian D.; Allori, Aldo; and Wilger, John A., 4,446,953, Cl. 192-70.120.

International Scientific Industries, Inc.: *See—*
Howlett, James F.; and Thompson, Marlin H., 4,447,750, Cl. 310-89.000.

International Standard Electric Corporation: *See—*
King, George D. H.; and Bone, Michael C., 4,447,116, Cl. 350-96.130.
Sutehall, Ralph, 4,447,122, Cl. 350-96.230.

International Telephone and Telegraph Corporation: *See—*
Benson, John; and Hanel, Harold L., 4,446,999, Cl. 227-11.000.
Borsuk, Leslie M., 4,447,120, Cl. 350-96.200.

InterNorth, Inc.: *See—*
Grose, Ronald D., 4,446,851, Cl. 126-449.000.

Inui, Toshiharu: *See*—
Kurata, Masami; Moriguchi, Fujio; Inui, Toshiharu; and Ohmori, Takashi, 4,447,832, Cl. 358-296.000.

Inukai, Mitsuo, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Tokai-Riki-Denki-Seisakusho. Seatbelt webbing retracting device. 4,447,017, Cl. 242-107.40A.

Inverse Square Systems Incorporated: *See*—
Raczynski, Walter V., 4,447,859, Cl. 362-13.000.

Irbe, Robert M.: *See*—
Horwath, Robert O.; and Irbe, Robert M., 4,447,531, Cl. 435-94.000.

Irie, Hiromitsu: *See*—
Watanabe, Masaru; Matsumura, Satoru; Amada, Takayoshi; Irie, Hiromitsu; and Saito, Norihisa, 4,447,293, Cl. 159-6.200.

IRT Corporation: *See*—
Friesenhahn, Stanley J., 4,447,727, Cl. 250-390.000.

Isaka, Kinichi: *See*—
Kawaguchi, Masashi; Ishii, Toshiaki; Isaka, Kinichi; and Uede, Hisashi, 4,447,757, Cl. 313-509.000.

Isaksson, G. E.: *See*—
Blosser, Virgil Y.; Isaksson, G. E.; Rupp, Dallas B.; and Singh, A. P., 4,447,385, Cl. 264-315.000.

Isenberg, Arnold O., to Westinghouse Electric Corp. Combustion control with flames. 4,447,204, Cl. 431-76.000.

Ishiguchi, Isao: *See*—
Tomuro, Noboru; Ishiguchi, Isao; Tsujikawa, Shinjiro; Kashima, Masao; and Miyashita, Yasuo, 4,447,853, Cl. 361-321.000.

Ishiguro, Norio: *See*—
Fukuda, Ryuichi; Fujiwara, Masami; and Ishiguro, Norio, 4,447,790, Cl. 330-149.000.

Ishii, Toshiaki: *See*—
Kawaguchi, Masashi; Ishii, Toshiaki; Isaka, Kinichi; and Uede, Hisashi, 4,447,757, Cl. 313-509.000.

Ishii, Yoshitaro: *See*—
Watanabe, Syuji; Ishii, Yoshitaro; and Sunagawa, Masao, 4,446,594, Cl. 15-323.000.

Ishikawa, Isao; Kanda, Hiroshi; and Katakura, Kageyoshi, to Hitachi, Ltd. Acoustic scanning microscope. 4,446,738, Cl. 73-606.000.

Ishikawa, Michio: *See*—
Aoshima, Shozo; Hirose, Noboru; and Ishikawa, Michio, 4,446,746, Cl. 73-862.330.

Ishikawa, Takuma: *See*—
Yuge, Shizuo; Sakakibara, Susumu; Ishikawa, Takuma; Kito, Nobuo; and Yamamoto, Toshio, 4,447,517, Cl. 430-122.000.

Ishikura, Yasuyuki: *See*—
Furuya, Koutaro; Honoda, Kazuho; Takeuchi, Takahito; Ishikura, Yasuyuki; and Kameda, Morihiro, 4,446,580, Cl. 3-6.000.

Ito, Masayoshi: *See*—
Ogura, Haruo; Furuhata, Kimio; Osawa, Toshiaki; Toyoshima, Satoshi; Shitori, Yoshiyasu; and Ito, Masayoshi, 4,447,600, Cl. 536-23.000.

Ito, Osamu; and Nishizawa, Kazunori, to Kao Soap Co., Ltd. Disposable diaper. 4,447,240, Cl. 604-385.000.

Ito, Tomoo, to Jupitor Corporation. Rotary drive device for inspecting turbo-fan engine blades. 4,446,728, Cl. 73-116.000.

Itoh, Chihiro: *See*—
Ohnishi, Haruo; Itoh, Chihiro; and Mochida, Ei, 4,447,437, Cl. 424-263.000.

ITT Industries, Incorporated: *See*—
Bearcroft, Kenneth E., 4,446,744, Cl. 73-861.280.
Boehm, Peter, 4,447,897, Cl. 91-369.00B.
Fieber, Werner H.; Hinze, Klaus; Huth, Manfred K. O.; Jost, Hans-Georg; Lamm, Klaus D.; Michalski, Dieter; and Rittaler, Konstantin, 4,447,686, Cl. 200-153.00J.

Ivani, Edward J. Amino-polysaccharides and copolymers thereof for contact lenses and ophthalmic compositions. 4,447,562, Cl. 523-105.000.

Ivey, H. Grady; and Sprouse, D. Leonard, to Strickland Systems, Inc. Joining concrete form panels to cast an inside corner wall structure. 4,447,035, Cl. 249-194.000.

Iwahashi, Hiroshi: *See*—
Asano, Masamichi; and Iwahashi, Hiroshi, 4,447,895, Cl. 365-226.000.

Iwanski, Richard V.: *See*—
Giardini, Dante S.; Iwanski, Richard V.; and Trumpy, David K., 4,446,825, Cl. 123-90.650.

Iwasaki, Shinichiro, to Aisin Seiki Kabushiki Kaisha. Ignition system. 4,446,842, Cl. 123-606.000.

Iyama, Hiroyuki; and Watanabe, Yoshio, to Hitachi Lighting, Ltd. Discharge lamp lighting device. 4,447,763, Cl. 315-207.000.

J. R. Simplot Company: *See*—
Bierman, Laurence W.; Long, Gary L.; and Bortner, David, 4,447,403, Cl. 423-20.000.

Jackson, Henry D. Liquid drain system. 4,447,321, Cl. 210-86.000.

Jackson, Joseph M.: *See*—
Harris, William J.; Jackson, Joseph M.; and Petty, David C., 4,447,676, Cl. 179-90.0BD.

Jackson, Melvin R.; and Rairden, John R., III, to General Electric Company. Process for making plasma spray-cast components using segmented mandrels. 4,447,466, Cl. 427-34.000.

Jackson, Peter, to Imperial Chemical Industries PLC. Ultrasonic identification of damage in lined structures. 4,446,736, Cl. 73-600.000.

Jackson, Philip, to E. Beaudrey & Cie. Trash rake with recovery gutter. 4,447,323, Cl. 210-158.000.

Jackson, Philip. Water screen with revolving screen member. 4,447,324, Cl. 210-159.000.

Jacobi, Manfred: *See*—
Henne, Andreas; Hesse, Anton; Jacobi, Manfred; Schornick, Gunnar; Vyvial, Rudolf; and Holoch, Klaus, 4,447,520, Cl. 430-281.000.

Jacobs, Robert S.; and Faulkner, D. John, to University of Calif., The Regents of the. Manoalide, an anti-inflammatory analgesic marine natural product. 4,447,445, Cl. 424-279.000.

Jacobson, Chester F., to Gillette Company, The. Razor handle. 4,446,619, Cl. 30-85.000.

Jacobson, Paul R.: *See*—
Scheinhaus, Myron G. J.; Jacobson, Paul R.; and Selner, Allen J., 4,446,633, Cl. 36-11.500.

Jacquesy, Jean-Claude: *See*—
Jouannetaud, Marie-Paule; Gesson, Jean-Pierre; and Jacquesy, Jean-Claude, 4,447,660, Cl. 568-774.000.

Jagen, Paul R.: *See*—
Houtz, Timothy W.; and Jagen, Paul R., 4,447,106, Cl. 339-126.00R.

Jain, Nirnal S.: *See*—
Loeffler, Otto E.; Jain, Nirnal S.; and Kauder, Otto S., 4,447,335, Cl. 252-1.000.

James, Glenn R.: *See*—
Hampton, William J.; James, Glenn R.; and Hatch, Raymond L., 4,447,203, Cl. 431-3.000.

Jankowiak, Roman; and Connell, Maurice W., to Conax Corporation. Explosively separable link. 4,447,084, Cl. 294-83.0AE.

Jansing, Walter; and Vinzens, Kurt, to INTERATOM Internationale Atomreaktorbau GmbH. Steam generator heated by liquid metal. 4,446,820, Cl. 122-32.000.

Jarrett, Robert B.: *See*—
Rumbaugh, Robert C.; and Jarrett, Robert B., 4,446,843, Cl. 123-609.000.

Jaumann, Leonhard; Tima, Zdenek; and Feierlein, Heinz, to Sachtler GmbH Filmtechnische Gerate. Weight balancer. 4,447,033, Cl. 248-563.000.

Jayadev, Tumkur S.; and Nugyen, On V., to Energy Conversion Devices, Inc. Multiphase thermoelectric alloys and method of making same. 4,447,277, Cl. 148-400.000.

Jeanjean, Marcel: *See*—
Bedu, Marcel; and Jeanjean, Marcel, 4,447,766, Cl. 315-241.00R.

Jenike & Johanson, Inc.: *See*—
Johanson, Jerry R.; and Royal, Thomas A., 4,446,717, Cl. 73-7.000.

Jenkins, James H. Method for retaining air pressure in a duct system. 4,447,078, Cl. 285-331.000.

Jennen, Wolfgang; and Sprugel, Gerd, to Claas OHG. Agricultural attachment for harvesting agricultural products arranged in rows. 4,446,682, Cl. 56-119.000.

Jensen, Henry E., to Allied Corporation. Reduced maintenance explosion damage resistant storage battery. 4,447,508, Cl. 429-57.000.

Jensen, Niels D.; and Nielsen, Kurt F., to Grundfos A/S. Centrifugal pump for moving gaseous liquids. 4,447,189, Cl. 415-168.000.

Jensen, Reed J.; Thorne, James M.; Cluff, Coran L.; and Hayes, John K., to United States of America, Energy. Method of separating boron isotopes. 4,447,303, Cl. 204-157.10R.

Jerobee Industries, Inc.: *See*—
Weglin, Walter, 4,447,286, Cl. 156-515.000.

Jeuken, Gerardus W.: *See*—
Gunneman, Paul; and Jeuken, Gerardus W., 4,446,893, Cl. 139-11.000.

Jewusiak, Stephen J., to Ethicon, Inc. Plastic ligating clips. 4,446,865, Cl. 128-321.000.

Jimenez, Ivan; and Rubin, Irving N. Telescope sight mount system for firearms. 4,446,644, Cl. 42-1.06ST.

Johanson, Jerry R.; and Royal, Thomas A., to Jenike & Johanson, Inc. Abrasive wear tester. 4,446,717, Cl. 73-7.000.

John Thomas Batts, Inc.: *See*—
Garrison, Judd F., 4,446,996, Cl. 223-96.000.

John Wyeth & Brother Limited: *See*—
Archibald, John L.; and Boyle, John T. A., 4,447,604, Cl. 544-219.000.

Johnson, Charles A.; and Lucker, Laurence H., Jr., to American Hoist & Derrick Company. Mooring apparatus for floating vessels. 4,446,807, Cl. 114-230.000.

Johnson, Erlon F.: *See*—
Cooper, Ronald F.; and Johnson, Erlon F., 4,447,121, Cl. 350-96.200.

Johnson, George F., Jr.: *See*—
Grender, Arnemann; and Johnson, George F., Jr., 4,446,626, Cl. 33-286.000.

Johnson, Griffin I.; and Kiefer, Judy E., to Eastman Kodak Company. Process for the purification of terephthalic acid. 4,447,646, Cl. 562-487.000.

Johnson, Jerry. L.: *See*—
Dunn, Stanley A.; Pomplun, Alan R.; Paquette, Elmer G.; Ethridge, Edwin C.; and Johnson, Jerry. L., 4,447,251, Cl. 65-142.000.

Johnson, Joel S., to Kent-Moore Corporation. Valve spring compressor for internal combustion engine. 4,446,608, Cl. 29-220.000.

Johnson, Paul H.; and Stevenson, Robert B. Footwear having improved shock absorption. 4,446,634, Cl. 36-29.000.

Johnson, Robert M., Jr.: *See*—
Ross, David S.; Johnson, Robert M., Jr.; and Malhotra, Ripudaman, 4,447,662, Cl. 568-939.000.

Johnson, Roy A., to Upjohn Company, The. Dibenzo diazacines. 4,447,607, Cl. 544-246.000.

Johnson, Russell W.: *See*—
O'Hara, Mark J.; and Johnson, Russell W., 4,447,556, Cl. 502-74.000.
Jones, Edward M., Jr.: *See*—
Smith, Lawrence A., Jr.; Jones, Edward M., Jr.; and Hearn, Dennis, 4,447,668, Cl. 585-639.000.
Jones, Howell A., Jr.: *See*—
Duwell, Edward C.; and Jones, Howell A., Jr., 4,447,890, Cl. 364-900.000.
Jones, Terence R.; Harrap, Kenneth R.; and Calvert, Alan H., to National Research Development Corporation. Anti-cancer quinazoline derivatives. 4,447,608, Cl. 544-287.000.
Jonsson, Jan U. E.; Blomgren, Rolf B. J. R.; and Edlund, Nils H. Spacer means for providing air gaps. 4,446,661, Cl. 52-95.000.
Jordan, Dale A.: *See*—
Crosby, Philip S.; and Jordan, Dale A., 4,447,803, Cl. 340-347.0CC.
Jordan, R. Paul, to Langer Biomechanics Group, Inc., The. Orthotic device. 4,446,856, Cl. 128-80.00R.
Joseph, Joseph P.: *See*—
Dusza, John P.; Joseph, Joseph P.; and Berstein, Seymour, 4,447,442, Cl. 424-273.00P.
Jost, Hans-Georg: *See*—
Fieber, Werner H.; Hinze, Klaus; Huth, Manfred K. O.; Jost, Hans-Georg; Lamm, Klaus D.; Michalski, Dieter; and Rittaler, Konstantin, 4,447,686, Cl. 200-153.00J.
Jouannetaud, Marie-Paule; Gesson, Jean-Pierre; and Jacquesy, Jean-Claude, to PCUK Produits Chimiques Ugine Kuhlmann. Process for the isomerization of ortho-and para-bromophenols or the ethers thereof into meta-bromophenols and corresponding ethers. 4,447,660, Cl. 568-774.000.
Joy, Richard L. Dispenser for applying adhesive tape. 4,447,281, Cl. 156-250.000.
Jump, Clarence E. Patient positioning device. 4,446,587, Cl. 5-83.000.
Junkers, John K. Universally usable hydraulic wrench for simultaneously tightening or loosening two threaded connectors or for tightening or loosening a single threaded connector with a greater force. 4,446,762, Cl. 81-57.390.
Jupitor Corporation: *See*—
Ito, Tomoo, 4,446,728, Cl. 73-116.000.
Justi, Eduard W.: *See*—
Brennecke, Peter W. R.; Ewe, Henning; and Justi, Eduard W., 4,447,302, Cl. 204-128.000.
Kabashima, Katsuhiko: *See*—
Takemae, Yoshihiro; Enomoto, Seiji; Nozaki, Shigeki; Mezawa, Tsutomu; and Kabashima, Katsuhiko, 4,447,745, Cl. 307-269.000.
Kabelwerke Reinshagen GmbH: *See*—
Gundel, Manfred; Schlamm, Heinz-Werner; and Schmitz, Klaus-Dieter, 4,447,806, Cl. 340-641.000.
Kabushiki Kaisha Daisei Kikai: *See*—
Suzuki, Tomosaburo; and Kato, Toshiki, 4,446,992, Cl. 222-196.000.
Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Asai, Yoshiharu, 4,446,937, Cl. 177-1.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Nakata, Minoru, 4,447,044, Cl. 254-309.000.
Nishikawa, Yoshinori; and Takahashi, Iwashige, 4,446,787, Cl. 100-99.000.
Kabushiki Kaisha Morita Seisakusho: *See*—
Kataoka, Kenzo; Nishimoto, Shinichi; and Matoba, Kazunari, 4,447,207, Cl. 433-69.000.
Kabushiki Kaisha Shikishima Chipton: *See*—
Kobayashi, Hisamine, 4,446,636, Cl. 51-7.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Imamura, Yoichi, 4,447,894, Cl. 365-219.000.
Kabushiki Kaisha Tokai-Riki-Denki-Seisakusho: *See*—
Inukai, Mitsuo, 4,447,017, Cl. 242-107.40A.
Kabuto, Masami: *See*—
Endo, Norio; Asayama, Yoshiaki; and Kabuto, Masami, 4,446,824, Cl. 123-52.00M.
Kadokawa, Toshiaki: *See*—
Nishimura, Haruki; Naruto, Shunsuke; Mizuta, Hiroyuki; Kadokawa, Toshiaki; and Kawashima, Katsuyoshi, 4,447,439, Cl. 424-267.000.
Kadota, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Simultaneous read-write IGFET memory cell. 4,447,891, Cl. 365-154.000.
Kahl, Manfred E. Spring loaded fish hook. 4,446,647, Cl. 43-36.000.
Kahl, William G., Jr.: *See*—
Mudge, Philip H.; and Kahl, William G., Jr., 4,447,726, Cl. 250-342.000.
Kahn, Iwan: *See*—
Heller, Rudolf; and Kahn, Iwan, 4,446,792, Cl. 102-473.000.
Kaiho, Shin-ichi: *See*—
Tanemura, Mitsura; Yamazaki, Tamotsu; Mizuno, Koji; Kaiho, Shin-ichi; Kakimoto, Morio; Hoshino, Eiichi; Matsunaga, Isao; and Hata, Shun-ichi, 4,447,453, Cl. 424-319.000.
Kajiyama, Ryuichi; and Yonemoto, Masashi, to Mitsubishi Denki Kabushiki Kaisha. Elevator speed instruction generating system. 4,446,946, Cl. 187-29.00R.
Kakimoto, Morio: *See*—
Tanemura, Mitsura; Yamazaki, Tamotsu; Mizuno, Koji; Kaiho, Shin-ichi; Kakimoto, Morio; Hoshino, Eiichi; Matsunaga, Isao; and Hata, Shun-ichi, 4,447,453, Cl. 424-319.000.
Kalbskopf, Reinhard; Baumberger, Otto; and Masson, Serge, to Societa Italiana Vetro SIV SpA. Apparatus for continuously depositing a layer of a solid material on the surface of a substrate brought to a high temperature. 4,446,815, Cl. 118-718.000.
Kalomeris, Mary. Belts with concealed pockets. 4,446,574, Cl. 2-338.000.
Kamboj, Ved P.: *See*—
Salman, Mohammad; Ray, Suprabhat; Kamboj, Ved P.; and Anand, Nitya, 4,447,622, Cl. 548-525.000.
Kameda, Morihiro: *See*—
Furuya, Koutaro; Hosoda, Kazuho; Takeuchi, Takahito; Ishikura, Yasuyuki; and Kameda, Morihiro, 4,446,580, Cl. 3-6.000.
Kamezaki, Yasushi: *See*—
Nakazawa, Toru; Fushida, Akira; and Kamezaki, Yasushi, 4,447,514, Cl. 430-81.000.
Kamihigoshi, Tsutomu: *See*—
Akiyama, Toru; Kamihigoshi, Tsutomu; Takagi, Shoji; and Maeda, Tadayuki, 4,447,663, Cl. 570-150.000.
Kamisada, Koji: *See*—
Ohashi, Shigeo; Nakamura, Tadashi; and Kamisada, Koji, 4,447,685, Cl. 200-67.00D.
Kamiyama, Fumio; Yamazaki, Kazutoshi; Kohara, Minoru; and Nagata, Mituo, to Sekisu Kagaku Kogyo Kabushiki Kaisha. Filler for liquid chromatography and method for separating water-soluble substances using said filler. 4,447,328, Cl. 210-635.000.
Kamm, Roger D. Method and apparatus for testing lip pressure applied to a smoking article and for calibrating the pressure testing apparatus. 4,446,747, Cl. 73-862.580.
Kamoshita, Katsuzo: *See*—
Noguchi, Hiroshi; Yoshida, Ryo; Sumida, Seizo; and Kamoshita, Katsuzo, 4,447,260, Cl. 71-118.000.
Kanaoka, Kunio; Okamoto, Takanori; and Matsuda, Hideaki, to Okura Kogyo Kabushiki Kaisha. Anaerobically curable composition and process for preparation thereof. 4,447,563, Cl. 523-176.000.
Kanda, Hiroshi: *See*—
Ishikawa, Isao; Kanda, Hiroshi; and Katakura, Kageyoshi, 4,446,738, Cl. 73-606.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Watanabe, Kiyoshi; Ideguchi, Satoshi; Ogura, Masahiro; Shimada, Masahiko; and Kawaharada, Hajime, 4,447,362, Cl. 260-396.00R.
Kaneko, Katumi: *See*—
Suzuki, Akira; Kaneko, Katumi; and Inoue, Nobuyoshi, 4,447,142, Cl. 354-246.000.
Kano, Tokio, to Olympus Optical Co., Ltd. System for discriminating a precipitation pattern of particles. 4,447,396, Cl. 422-73.000.
Kanto Denka Kogyo Co., Ltd.: *See*—
Suzuki, Shintaro; Iizuka, Sadao; and Moriya, Yoshimi, 4,447,264, Cl. 75-251.000.
Kanto Ishi Pharmaceutical Co., Ltd.: *See*—
Ogura, Haruo; Furuhata, Kimio; Osawa, Toshiaki; Toyoshima, Satoshi; Shitori, Yoshiyasu; and Ito, Masayoshi, 4,447,600, Cl. 536-23.000.
Kao Soap Co., Ltd.: *See*—
Ito, Osamu; and Nishizawa, Kazunori, 4,447,240, Cl. 604-385.000.
Kaplan, James W., to Harlan Material Handling Corporation. Extensible hitch for towing vehicles. 4,447,071, Cl. 280-479.00R.
Karian, Harutun G.; and Todd, David B., to Baker Perkins Inc. Method of centrifugally pelletizing certain synthetic plastic materials. 4,447,383, Cl. 264-8.000.
Karth, Beat: *See*—
Buri, Hermann; and Karth, Beat, 4,447,184, Cl. 413-26.000.
Karubian, Ralph; Breukelman, Robert G.; and Weston, Lynn R., to Kentmaster Mfg. Co., Inc. Stunning gun. 4,446,598, Cl. 17-1.00B.
Karubian, Ralph K.; and Coelho, Gregorio J., to Kentmaster Mfg. Co., Inc. Stunning gun with improved control valve. 4,446,599, Cl. 17-1.00B.
Kasaaian, Arash S.; and Dash, John, to State of Oregon Acting by and Through the State Board of Higher Education on behalf of Portland State University. Use of alcohol for increasing the current efficiency of chromium plating. 4,447,299, Cl. 204-43.00R.
Kasahara, Yoshiki: *See*—
Noro, Masao; and Kasahara, Yoshiki, 4,447,791, Cl. 330-297.000.
Kasai, Shozo: *See*—
Nishizawa, Hiroshi; Mukoyama, Yoshiyuki; and Kasai, Shozo, 4,447,589, Cl. 528-45.000.
Kasai, Yoshiaki; and Ohgami, Masaaki, to Fuji Jukogyo Kabushiki Kaisha; and Nissan Motor Co., Ltd. System for detecting the transient state of engine operation. 4,447,880, Cl. 364-431.050.
Kashima, Masao: *See*—
Tomuro, Noboru; Ishiguchi, Isao; Tsujikawa, Shinjiro; Kashima, Masao; and Miyashita, Yasuo, 4,447,853, Cl. 361-321.000.
Kaspar, Don G.: *See*—
Knickerbocker, Karl, deceased, 4,446,956, Cl. 194-1.00L.
Kasper, Horst: *See*—
Mundt, Johann; Kasper, Horst; and Pritsch, Eckhard, 4,447,788, Cl. 318-799.000.
Kasuya, Hideo; and Endo, Hiroshi, to Nissan Motor Company, Limited. Obstacle detector for use in vehicles. 4,447,800, Cl. 340-904.000.
Katagiri, Masayoshi; Kondo, Toshio; and Midooka, Masanori, to Toyota Jidosha Kabushiki Kaisha; Aisin Seiki Kabushiki Kaisha; and Toyoda Gosei. Sealing boot. 4,447,066, Cl. 277-212.0FB.
Katakura, Kageyoshi: *See*—
Ishikawa, Isao; Kanda, Hiroshi; and Katakura, Kageyoshi, 4,446,738, Cl. 73-606.000.
Kataoka, Kenzo; Nishimoto, Shinichi; and Matoba, Kazunari, to Kabushiki Kaisha Morita Seisakusho. Mandibular motion diagnostic device. 4,447,207, Cl. 433-69.000.
Katayama, Aisuke. Non self-starting thermal magnetic energy recycling ferrite ring engine. 4,447,736, Cl. 290-1.00R.

Kato, Hirohisa: *See*—
Oguchi, Toshihiko; Kato, Hirohisa; and Yokoyama, Hirotaka, 4,447,467, Cl. 427-48.000.
Kato, Kimihiro: *See*—
Nagasaku, Eiichi; Kato, Kimihiro; and Yasunaga, Masao, 4,447,196, Cl. 418-93.000.
Kato, Masayuki: *See*—
Kishimoto, Teiji; Kochi, Hiromu; and Kato, Masayuki, 4,447,436, Cl. 424-258.000.
Kato, Tetsuo, to Tokico Ltd. Method for filling pressurized gas into a cylinder device. 4,446,895, Cl. 141-4.000.
Kato, Toshikazu, to Olympus Optical Co., Ltd. Cassette loading/unloading apparatus for cassette tape recorder. 4,447,838, Cl. 360-96.500.
Kato, Toshiki: *See*—
Suzuki, Tomosaburo; and Kato, Toshiki, 4,446,992, Cl. 222-196.000.
Katto, Takayuki; Komatsu, Yasumasa; and Shiiki, Zenya, to Kureha Kagaku Kogyo Kabushiki Kaisha. Thermoplastic resin composition. 4,447,578, Cl. 525-75.000.
Kauder, Otto S.: *See*—
Loeffler, Otto E.; Jain, Nirnal S.; and Kauder, Otto S., 4,447,335, Cl. 252-1.000.
Kawagoe, Michio: *See*—
Sekiguchi, Kiyonori; Igashira, Toshihiko; Tanaka, Takeshi; Kawai, Hisasi; Yamada, Mitsumasa; Kawagoe, Michio; and Tanaka, Masaaki, 4,446,839, Cl. 123-569.000.
Kawaguchi, Masashi; Ishii, Toshiaki; Isaka, Kinichi; and Uede, Hisashi, to Sharp Kabushiki Kaisha. Structure of thin-film electroluminescent display panel sealed by glass substrates. 4,447,757, Cl. 313-509.000.
Kawaharada, Hajime: *See*—
Watanabe, Kiyoshi; Ideguchi, Satoshi; Ogura, Masahiro; Shimada, Masahiko; and Kawaharada, Hajime, 4,447,362, Cl. 260-396.00R.
Kawai, Hisasi: *See*—
Sekiguchi, Kiyonori; Igashira, Toshihiko; Tanaka, Takeshi; Kawai, Hisasi; Yamada, Mitsumasa; Kawagoe, Michio; and Tanaka, Masaaki, 4,446,839, Cl. 123-569.000.
Kawai, Masakatsu, to Shofu, Inc. Dental polisher. 4,447,208, Cl. 433-166.000.
Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph, 4,446,769, Cl. 84-1.010.
Kawai, Shinji: *See*—
Suzuki, Koichi; Yoshihara, Mikio; Kawai, Shinji; and Mori, Katsuhiro, 4,446,584, Cl. 4-237.000.
Kawakami, Hiroshi: *See*—
Nakada, Seiichi; Ohno, Hiroshi; Nishijima, Tsuneo; and Kawakami, Hiroshi, 4,446,595, Cl. 15-365.000.
Kawakami, Toshio; and Kimura, Izumi, to Toshiba Kikai Kabushiki Kaisha. Method and apparatus for controlling tool magazines. 4,446,612, Cl. 29-568.000.
Kawamura, Yoshihisa: *See*—
Nakagawa, Toyoaki; Nakajima, Masao; Kawamura, Yoshihisa; and Shioyama, Giichi, 4,446,840, Cl. 123-571.000.
Kawanishi, Shozo, to Yamato Scale Company. Ltd. Combination weighing machine. 4,446,938, Cl. 177-25.000.
Kawashima, Katsuyoshi: *See*—
Nishimura, Haruki; Naruto, Shunsuke; Mizuta, Hiroyuki; Kadokawa, Toshiaki; and Kawashima, Katsuyoshi, 4,447,439, Cl. 424-267.000.
Kay, Ian T.; Bartholomew, David; Williams, Emyr G.; and Noon, Robert A., to Imperial Chemical Industries PLC. Certain cyano containing aryl amides, compositions containing same and fungicidal use thereof. 4,447,446, Cl. 424-282.000.
Kay, Robert E., to Ford Aerospace & Communications Corporation. Composition control of CSVPE HgCdTe. 4,447,470, Cl. 427-76.000.
Kaye, Gordon E.; Schwartz, Eugene B.; and Sollins, Irving V., to CCT Associates. Medicament implant applicator. 4,447,223, Cl. 604-61.000.
Keable, John B., to QMI Corporation. Photographic film coating apparatus and method. 4,447,468, Cl. 427-54.100.
Keeley, Charles: *See*—
Brecker, Lawrence R.; Keeley, Charles; and Brilliant, Stuart D., 4,447,569, Cl. 524-109.000.
Kegeler, Gary H.: *See*—
Adl, Mohammad S.; Kegeler, Gary H.; and Vandersall, Howard L., 4,447,337, Cl. 252-7.000.
Keiai Orthopedic Appliance Co., Ltd.: *See*—
Furuya, Koutaro; Hosoda, Kazuho; Takeuchi, Takahito; Ishikura, Yasuyuki; and Kameda, Morihiro, 4,446,580, Cl. 3-6.000.
Keith Hancock Structures Limited: *See*—
Chapman, Leslie J., 4,447,029, Cl. 248-246.000.
Keleher, Lloyd F.: *See*—
Spitz, Seymour J., Jr.; Mookherjee, Braja D.; Hill, Ira D.; Keleher, Lloyd F.; Trenkle, Robert W.; and Wolff, Robin K., 4,446,651, Cl. 47-10.000.
Keller, Douglas V., Jr.: *See*—
Smith, Clay D.; and Keller, Douglas V., Jr., 4,447,245, Cl. 44-1.0SR.
Keller, Richard A.: *See*—
Cremers, David A.; and Keller, Richard A., 4,447,153, Cl. 356-361.000.
Kelley, Mellis M.: *See*—
Smith, Richard R.; and Kelley, Mellis M., 4,447,595, Cl. 528-274.000.
Kelly, James B.; and Kelly, Viola F. Double door security rural mailbox with automatic signalling means. 4,447,005, Cl. 232-35.000.
Kelly, Joseph D.: *See*—
Franz, Helmut; Duffer, Paul F.; and Kelly, Joseph D., 4,447,496, Cl. 428-432.000.
Kelly, Viola F.: *See*—
Kelly, James B.; and Kelly, Viola F., 4,447,005, Cl. 232-35.000.
Kelsey, Charles C., Jr.; and Wolff, Walter C., to Devel Corporation. Cartridge magazine and follower for autoloading firearms. 4,446,645, Cl. 42-50.000.
Kelsey Hayes Company: *See*—
Rozmus, Walter J., 4,447,390, Cl. 419-49.000.
Van Sikle, Truman T.; and Drake, Charles J., 4,447,698, Cl. 219-110.000.
Kembo, Yukio: *See*—
Kuni, Asahiro; Kembo, Yukio; Akiyama, Nobuyuki; and Aoki, Nobuhiko, 4,447,731, Cl. 250-442.100.
Kendall Company, The: *See*—
Patel, Bhupendra C., 4,447,228, Cl. 604-103.000.
Kenergy Corporation: *See*—
Weisner, Kent A.; and Walls, Lester L., Jr., 4,447,200, Cl. 425-388.000.
Kennametal Inc.: *See*—
Warren, Donald W., 4,447,175, Cl. 407-114.000.
Kenney, George H. W., to Kenney, Richard. Price ticket and like displays. 4,446,640, Cl. 40-16.200.
Kenney, Richard: *See*—
Kenney, George H. W., 4,446,640, Cl. 40-16.200.
Kent-Moore Corporation: *See*—
Johnson, Joel S., 4,446,608, Cl. 29-220.000.
Kent, Stephen L., to Motorola Inc. Overcurrent protection circuit for a multiple output switching power supply and method therefor. 4,447,841, Cl. 361-18.000.
Kentmaster Mfg. Co., Inc.: *See*—
Karubian, Ralph; Breukelman, Robert G.; and Weston, Lynn R., 4,446,598, Cl. 17-1.00B.
Karubian, Ralph K.; and Coelho, Gregorio J., 4,446,599, Cl. 17-1.00B.
Kern, Bernd M.; and Hasse, Werner, to Precitronic Gesellschaft fur Feinmechanik und Electronic mbH. Simulated portable rocket launcher. 4,447,211, Cl. 434-12.000.
Kershner, Larry D.; Thompson, Leonard R.; and Strom, Robert M., to Dow Chemical Company, The. Solvent system for oxidative coupling process. 4,447,656, Cl. 568-730.000.
Kersten, Peter; Meixner, Peter; Muller, Erich; and Horing, Eckart, to VEB Schwermaschinenbaukombinat TAKRAF. Bucket wheel bearing with split rolling bearing. 4,447,165, Cl. 384-428.000.
Keske, Robert G.; Brooks, Gary T.; and Bockrath, Ronald E., to Standard Oil Company (Indiana). Injection moldable amide-imide polymers containing calcium moieties. 4,447,574, Cl. 524-400.000.
Kiefer, Judy E.: *See*—
Johnson, Griffin I.; and Kiefer, Judy E., 4,447,646, Cl. 562-487.000.
Kikuchi, Nobuaki: *See*—
Masujima, Sho; Shibuya, Masahide; Shoichi, Iwaya; Umeda, Kenichi; Oikawa, Yasunobu; Abe, Hisao; Midori, Yoshifumi; Fujiwara, Shinobu; and Kikuchi, Nobuaki, 4,447,549, Cl. 501-138.000.
Kilborn, Fredrick A.: *See*—
Reed, Stewart D.; Sills, Arthur A.; Kraft, John H.; Houle, Raymond T.; Redwine, Michael A.; and Kilborn, Fredrick A., 4,446,586, Cl. 4-555.000.
Kimball International, Inc.: *See*—
Bass, Steven C., 4,446,770, Cl. 84-1.010.
Kimura, Etsuji; Ogi, Katsumi; Sato, Kazusuke; and Hashimoto, Mayuki, to Mitsubishi Kinzoku Kabushiki Kaisha. Apparatus for preparing high-melting-point high-toughness metals. 4,447,045, Cl. 266-149.000.
Kimura, Izumi: *See*—
Kawakami, Toshio; and Kimura, Izumi, 4,446,612, Cl. 29-568.000.
Kimura, Katsuhiro; Endo, Akira; and Takezaki, Jiro, to Hitachi, Ltd. Ignition system for internal combustion engine. 4,446,826, Cl. 123-143.00B.
Kindlmann, Peter J.: *See*—
Yarwood, John C.; Ungarean, Gary L.; Kindlmann, Peter J.; and Tyler, Derek E., 4,446,909, Cl. 164-453.000.
King, George D. H.; and Bone, Michael C., to International Standard Electric Corporation. Controllable electro-optical modulator/phase shifter using an integrated optical interferometer. 4,447,116, Cl. 350-96.130.
King, James D.: *See*—
Puvogel, Timothy J.; King, James D.; and Moore, David O., 4,446,780, Cl. 99-480.000.
Kinkopf, Edward J.; and Polen, Karl L., to Alliance Machine Company, The. Mould handling, cleaning and preparation systems. 4,446,813, Cl. 118-72.000.
Kinnie, D. Craig; and Boberg, Richard W., to Intel Corporation. Apparatus and method for providing byte and word compatible information transfers. 4,447,878, Cl. 364-200.000.
Kioritz Corporation: *See*—
Inaga, Hisashi; and Yokocho, Yoetsu, 4,446,822, Cl. 123-41.310.
Kirchbrucher, Rudiger: *See*—
Becker, Kunibert; Dunkel, Gerd; Lagodka, Gunter; and Kirchbrucher, Rudiger, 4,447,174, Cl. 405-293.000.
Kirchhoff, F. J.: *See*—
Reidick, H.; Leithner, R.; Kirchhoff, F. J.; Puritz, E.; and Schluter, S., 4,446,911, Cl. 165-4.000.
Kirchner, Charles H., Jr.; and McDonald, Thomas K. Paint roller cleaner. 4,446,590, Cl. 15-302.000.

Kirk, William F.: *See*—
Baum, Eric A.; Davies, Leslie J.; Kirk, William F.; and Wass, Anthony C. L., 4,446,862, Cl. 128-203.150.

Kishida, Eiichi: *See*—
Morioka, Akihiro; Maeda, Yuji; Matsumoto, Tetsuro; Yukinari, Masakazu; and Kishida, Eiichi, 4,447,309, Cl. 204-402.000.

Kishida, Katsuji; Oonishi, Masakazu; and Oda, Keijiro, to Toyo Rubber Industry Co. Ltd., The. Pneumatic radial tire having highly durable bead structure. 4,446,904, Cl. 152-356.00R.

Kishimoto, Teiji; Kochi, Hiromu; and Kato, Masayuki, to Fujisawa Pharmaceutical Co., Ltd. 1,2,3,4-Tetrahydroisoquinolines 6,10,7,8 dihydroxy substitute-1-methylanilino and use as smooth muscle relaxants. 4,447,436, Cl. 424-258.000.

Kistner, Oscar J., to Mead Corporation, The. Center special slotted containers having self-squaring joints. 4,447,002, Cl. 229-37.00R.

Kitajima, Masato: *See*—
Asaeda, Toshio; Suzuki, Ikuo; Imai, Tomoyasu; and Kitajima, Masato, 4,446,657, Cl. 51-206.00R.

Kitamoto, Tatsuji; and Shirahata, Ryuji, to Fuji Photo Film Co., Ltd. Apparatus for manufacturing a magnetic recording medium. 4,446,816, Cl. 118-718.000.

Kitamura, Masao: *See*—
Matsumoto, Michio; Kitamura, Masao; Ohta, Masataka; and Ohshima, Takeshi, 4,446,789, Cl. 101-93.040.

Kitamura, Takashi, to Canon Kabushiki Kaisha. Semi-conductor laser device. 4,447,136, Cl. 350-432.000.

Kitamura, Yasuo; Suzuki, Masao; Kubota, Toshio; Watanabe, Hiroshi; and Tsujimoto, Masaaki, to Toyo Engineering Corporation. Method for pressure transport of methanol through a pipeline. 4,446,881, Cl. 137-1.000.

Kitayama, Yoshifumi: *See*—
Azuma, Yusaku; Kitayama, Yoshifumi; and Ozawa, Chiaki, 4,447,014, Cl. 242-55.000.

Kito, Nobuo: *See*—
Yuge, Shizuo; Sakakibara, Susumu; Ishikawa, Takuma; Kito, Nobuo; and Yamamoto, Toshio, 4,447,517, Cl. 430-122.000.

Kiyota, Takao: *See*—
Sakamoto, Hajimu; Kiyota, Takao; and Hayashi, Hiroshi, 4,447,355, Cl. 260-112.00B.

Klaubert, Dieter H.; and Bell, Stanley C., to American Home Products Corporation. Benzo-fused and heterocyclic fused imidazole anti-ulcer agents. 4,447,611, Cl. 546-118.000.

Klayman, Daniel L.; Scovill, John P.; Bartosevich, Joseph F.; Mason, Carl J.; and Griffin, T. Scott, to United States of America, Army. Method for treating bacterial infections with 2-acetyl- and 2-propionylpyridine thiosemicarbazones. 4,447,427, Cl. 424-244.000.

Klein, Hermann: *See*—
Stephan, Hans-Werner; Klein, Hermann; and Lehr, Klaus, 4,447,400, Cl. 422-150.000.

Klein, Richard G.; and Houck, Robert J., to B. F. Goodrich Company, The. Signal to noise ratio improvement for rip detectors. 4,447,807, Cl. 340-676.000.

Kleinecke, John D.: *See*—
Farag, Samir F.; Hoffmann, Alvin R.; and Kleinecke, John D., 4,447,858, Cl. 361-429.000.

Klockner-Humboldt-Deutz AG: *See*—
Beele, Gunther, 4,447,046, Cl. 266-216.000.
Hilbrans, Hermann; and Rao, Chatty, 4,447,261, Cl. 75-5.000.

Klothen, Irving, to American Cyanamid Company. Process for the preparation of medicated animal feed supplement. 4,447,421, Cl. 424-227.000.

Klusmier, Kenneth L., to Morgan Construction Company. Apparatus and method for unscrambling and separating elongated elements. 4,446,961, Cl. 198-443.000.

Knappe, Ortwin: *See*—
Botzem, Werner; Knappe, Ortwin; and Laug, Reiner, 4,447,730, Cl. 250-506.100.

Knepper, Jay C., to Standard Oil Company (Indiana); and Gulf Oil Corporation. Process for forming an in situ oil shale retort. 4,447,090, Cl. 299-2.000.

Knickerbocker Case Company: *See*—
Moloney, Donald J., 4,446,966, Cl. 206-334.000.

Knickerbocker, Karl, deceased (by Knickerbocker, Lillie M., heir), to Kaspar, Don G., a part interest. Single coin carriage bar. 4,446,956, Cl. 194-1.00L.

Knickerbocker, Lillie M., heir: *See*—
Knickerbocker, Karl, deceased, 4,446,956, Cl. 194-1.00L.

Knobloch, James O.: *See*—
Donohue, John A.; Knobloch, James O.; Petty-Weeks, Bruce; and Cerefice, Steven A., 4,447,645, Cl. 562-473.000.

Knodle, Daniel W., to Trimed, Inc. Water absorbing trap to protect an infrared exhaled carbon dioxide apnea monitor of a patient's respiration. 4,446,869, Cl. 128-716.000.

Knudsen, Poul H., to Clean-Tex A/S. Vulcanizing press for vulcanizing flat articles. 4,447,201, Cl. 425-397.000.

Kobayashi, Hiroto; and Kobayashi, Takeshi, to Walbro Far East, Inc. Supplementary fuel supply mechanism for internal combustion engines. 4,447,370, Cl. 261-35.000.

Kobayashi, Hisamine, to Kabushiki Kaisha Shikishima Chipton. Long-travel annular vibratory barrel finishing apparatus for line-processing. 4,446,656, Cl. 51-7.000.

Kobayashi, Takao: *See*—
Mizukawa, Takumi; Amagami, Keizo; and Kobayashi, Takao, 4,447,691, Cl. 219-10.49R.

Kobayashi, Takeshi: *See*—
Kobayashi, Hiroto; and Kobayashi, Takeshi, 4,447,370, Cl. 261-35.000.

Kobylinski, Thaddeus P.: *See*—
Pretzer, Wayne R.; Kobylinski, Thaddeus P.; and Bozik, John E., 4,447,557, Cl. 502-161.000.

Koch, Dirk: *See*—
Schuster-Woldan, Hans; Buerk, Hermann; Koch, Dirk; and Weingand, Kaspar, 4,447,292, Cl. 156-644.000.

Kochi, Hiromu: *See*—
Kishimoto, Teiji; Kochi, Hiromu; and Kato, Masayuki, 4,447,436, Cl. 424-258.000.

Kochs Adler AG: *See*—
Scholl, Hans, 4,446,802, Cl. 112-121.120.

Kodama, Kazuyuki; Endo, Takeyuki; Okada, Kunihiro; and Shibuya, Yasutaka, to Hitachi, Ltd.; and Hitachi Denshi Kabushiki Kaisha. High resolution figure displaying device utilizing plural memories for storing edge data of even and odd horizontal scanning lines. 4,447,809, Cl. 340-747.000.

Koehring Canada Limited: *See*—
Kurelek, John, 4,446,897, Cl. 144-34.00R.

Koene, Johan W., to Hollandse Signaalapparaten B.V. Optical slip rings. 4,447,114, Cl. 350-96.200.

Koerner, Gotz: *See*—
Fink, Hans-Ferdi; Koerner, Gotz; and Luksch, Edmund, 4,447,498, Cl. 428-447.000.

Kogane, Mikio; and Yamazaki, Seiichi, to Kogane, Mikio; and Yamazaki, Seiichi. Photographic printing apparatus. 4,447,146, Cl. 355-28.000.

Kohara, Minoru: *See*—
Kamiyama, Fumio; Yamazaki, Kazutoshi; Kohara, Minoru; and Nagata, Mituo, 4,447,328, Cl. 210-635.000.

Kohl, Arthur L.: *See*—
Gay, Richard L.; Kohl, Arthur L.; and Yosim, Samuel J., 4,447,262, Cl. 75-65.00R.

Kohl, James E.: *See*—
Hartman, Adrian R.; Kohl, James E.; MacPherson, William F.; and Riley, Terence J., 4,447,744, Cl. 307-252.00R.

Kohler, Karl A.: *See*—
House, Richard F.; and Kohler, Karl A., 4,447,004, Cl. 229-52.00B.

Kohmoto, Kohtaro; Ebara, Hiroyuki; and Nira, Hisami, to Tokyo Shibaura Denki Kabushiki Kaisha. Fluorescent lamp with layer of plural phosphors having different particle sizes. 4,447,756, Cl. 313-487.000.

Koike, Eishi, to Ozen Corporation. Simplified sound reproducing device driven by a spring motor. 4,447,898, Cl. 369-65.000.

Kojima, Takafumi; Yoshida, Shigeru; and Mizoguchi, Masayuki, to Hitachi, Ltd.; and Nippon Telegraph & Telephone Public Corporation. Subscriber line testing system. 4,447,679, Cl. 179-175.30R.

Kokido, Toshiyuki. Packing apparatus for a squeezed package. 4,446,677, Cl. 53-577.000.

Kollmorgen Technologies Corporation: *See*—
Whited, James S., 4,447,771, Cl. 18-661.000.

Komatsu, Yasumasa: *See*—
Katto, Takayuki; Komatsu, Yasumasa; and Shiiki, Zenya, 4,447,578, Cl. 525-75.000.

Kondo, Kenjiro: *See*—
Kusumegi, Asao; Kondo, Kenjiro; Watase, Yoshiyuki; Yoshimura, Yoshio; and Miyake, Kozo, 4,447,734, Cl. 250-517.100.

Kondo, Syun-ichi; Sano, Kenji; and Sato, Hideo, to Fuji Photo Film Co., Ltd. Photoconductive composition and electrophotographic light-sensitive material using it. 4,447,515, Cl. 430-83.000.

Kondo, Toshio: *See*—
Katagiri, Masayoshi; Kondo, Toshio; and Midooka, Masanori, 4,447,066, Cl. 277-212.0FB.

Konig, Wilhelm. Rotary crane. 4,446,975, Cl. 212-188.000.

Konkel, Joseph; and Sweeney, David F. Printer with removable print carriage. 4,446,790, Cl. 101-93.140.

Koo, Ronald. Filament switching device. 4,447,760, Cl. 315-65.000.

Kopena, David M., to Owens-Corning Fiberglas Corporation. Blowing wool separator method and apparatus. 4,447,249, Cl. 65-4.400.

Koppers Company, Inc.: *See*—
Ahn, Byung K.; and Morris, Kenneth A., 4,447,405, Cl. 423-88.000.
Leston, Gerd, 4,447,654, Cl. 568-708.000.
Leston, Gerd, 4,447,658, Cl. 568-750.000.
Prew, Stanley, 4,447,011, Cl. 241-37.000.

Kor, Bouko J.: *See*—
Rempel, William; and Kor, Bouko J., 4,446,683, Cl. 56-296.000.

Kornrumpf, William P.; and Cote, Paul T., to General Electric Company. Power supply for low-voltage incandescent lamp and like load. 4,447,764, Cl. 315-240.000.

Kose, Saburo: *See*—
Ebata, Yoshihiro; Kose, Saburo; and Hayami, Ryozo, 4,447,283, Cl. 156-325.000.

Koski, Robert R.: *See*—
Bradley, Kirk D.; Koski, Robert R.; and Clark, James W., 4,447,072, Cl. 280-492.000.

Kosow, David P.: *See*—
Menache-Aronson, Doris; Kosow, David P.; Orthner, Carolyn L.; and Behre, H. Evan, 4,447,416, Cl. 424-101.000.

Koszi, Louis A.: *See*—
Dixon, Richard W.; Koszi, Louis A.; Miller, Richard C.; and Schwartz, Bertram, 4,447,905, Cl. 372-46.000.

Kotsanis, Constantine A., to Endoscopy Surgical Systems, Inc. Multipurpose medical devices. 4,447,227, Cl. 604-95.000.

Kotzur, Joachim; Reinersmann, Hans H.; Albers, Rolf; Aschenbruck, Emil; and Neuhaus, Gunter, to M.A.N. Maschinenfabrik Augsburg-Nurnberg A.G. Shaft seal with positively magnetically controlled sealing gap. 4,447,063, Cl. 277-80.000.

Kourimsky, Friedrich J. A.; and Lothmann, Werner, to AMP Incorporated. Electrical connector assemblies. 4,447,102, Cl. 339-91.00R.

Kowalczyk, Annette: *See*—
Gage, Clifford H., 4,447,000, Cl. 227-49.000.

Kraft, John H.: *See*—
Reed, Stewart D.; Sills, Arthur A.; Kraft, John H.; Houle, Raymond T.; Redwine, Michael A.; and Kilborn, Fredrick A., 4,446,586, Cl. 4-555.000.

Kramss, Richard H.: *See*—
Scharrer, Roland P. F.; Schluenz, Robert W.; and Kramss, Richard H., 4,447,354, Cl. 260-106.000.

Kratzsch, Eberhard: *See*—
Linhart, Heinz; Modtler, Reiner; and Kratzsch, Eberhard, 4,447,489, Cl. 428-225.000.

Krauthausen, Edmund: *See*—
Busse, Wolf-Dieter; Krauthausen, Edmund; and Mardin, Mithat, 4,447,440, Cl. 424-269.000.

Kreiskott, Horst: *See*—
Steiner, Gerd; Hofmann, Hans P.; Kreiskott, Horst; Teschendorf, Hans-Juergen; and Lenke, Dieter, 4,447,610, Cl. 544-381.000.

Kreuttner, Albert, to Carl-Zeiss-Stiftung. Method and apparatus for molding parts having an aspherical surface. 4,447,372, Cl. 264-2.200.

Krewenka, Thomas: *See*—
Gold, Vance B.; Kubacki, Edward F.; and Krewenka, Thomas, 4,447,699, Cl. 219-110.000.

Kriegel, Ernst: *See*—
Coenen, Hubert; and Kriegel, Ernst, 4,446,921, Cl. 166-267.000.

Krischer Metal Products Co., Inc.: *See*—
Gelfman, Stanley, 4,446,776, Cl. 99-401.000.

Kristiansen, Olaf; and Brannstrom, Bo, to Moss Rosenberg Verft A/S; and Saga Petroleum a.s. & Co. Method of transporting oil and gas under high pressure in tanks on board a ship. 4,446,804, Cl. 114-74.00R.

Krocker, Robert E., to Trane Company, The. Auto changeover thermostat with means for handling temperature entry errors. 4,446,913, Cl. 165-12.000.

Krouthen, Jan K., to Aktiebolaget Electrolux. Method for sterilization with formalin. 4,447,394, Cl. 422-27.000.

Krull, Irwin H.: *See*—
Schwartz, Henry D.; Krull, Irwin H.; Clement, Carl P.; Stengel, Frederick H.; and Hayslett, David D., 4,447,398, Cl. 422-102.000.

Krutak, James J.; and Maleski, Robert J., to Eastman Kodak Company. Preparation of thiophenes. 4,447,624, Cl. 549-69.000.

Krutten, Victor, to Dr. Eduard Fresenius Chemisch-Pharmazeutishe Industry KG. Catheter with radiographic contrast strips. 4,447,239, Cl. 604-282.000.

Kubacki, Edward F.: *See*—
Gold, Vance B.; Kubacki, Edward F.; and Krewenka, Thomas, 4,447,699, Cl. 219-110.000.

Kubis, Charles S.: *See*—
Roth, Donald J.; Walter, John; and Kubis, Charles S., 4,446,984, Cl. 220-268.000.

Kubota, Toshio: *See*—
Kitamura, Yasuo; Suzuki, Masao; Kubota, Toshio; Watanabe, Hiroshi; and Tsujimoto, Masaaki, 4,446,881, Cl. 137-1.000.

Kubozuka, Takao, to Nissan Motor Co., Ltd. Cylinder block of internal combustion engine. 4,446,827, Cl. 123-195.00R.

Kuch, Philip L.: *See*—
McGuiggan, Michael F.; and Kuch, Philip L., 4,447,409, Cl. 423-416.000.

Kuecker, Ward A.; Stratton, Susan D.; and Cason, William C., to International Business Machines Corporation. Mixed pitch display. 4,447,888, Cl. 364-900.000.

Kuhle, Engelbert: *See*—
Dickore, Karlfried; and Kuhle, Engelbert, 4,447,635, Cl. 560-115.000.

Kummernehr, Hans; and Sommer, Rolf, to Grunzweig & Hartmann und Glasfaser AG. Thermal insulating flexible ceramic containing flame hydrolysis produced microporous oxide aerogel. 4,447,345, Cl. 252-62.000.

Kuni, Asahiro; Kembo, Yukio; Akiyama, Nobuyuki; and Aoki, Nobuhiko, to Hitachi, Ltd. Exterior view examination apparatus. 4,447,731, Cl. 250-442.100.

Kunome, Yoshimi: *See*—
Yoneda, Kenji; Arai, Shoji; and Kunome, Yoshimi, 4,446,834, Cl. 123-440.000.

Kunz, Walter, to Ciba-Geigy Corporation. 1,3-Dioxolan-5-one derivatives. 4,447,625, Cl. 549-265.000.

Kunze, Dieter: *See*—
Chobanov, Tsvetko; Kunze, Dieter; and Woeffler, Friedrich, 4,447,376, Cl. 264-42.000.

Kuphal, John E.: *See*—
Heinzelman, Bert D.; Spranger, Douglas M.; Brookes, Malcolm J.; and Kuphal, John E., 4,447,482, Cl. 428-42.000.

Kurata, Masami; and Moriguchi, Fujio, to Fuji Xerox Co., Ltd. Multicolor heat-sensitive recording apparatus. 4,447,818, Cl. 346-76.0PH.

Kurata, Masami; Moriguchi, Fujio; Inui, Toshiharu; and Ohmori, Takashi, to Fuji Xerox Co., Ltd. Reproducing machine. 4,447,832, Cl. 358-296.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Katto, Takayuki; Komatsu, Yasumasa; and Shiiki, Zenya, 4,447,578, Cl. 525-75.000.

Kurek, Paul R., to UOP Inc. Preparation of alkyl aryl ethers. 4,447,652, Cl. 568-658.000.

Kurelek, John, to Koehring Canada Limited. Improvements in disc felling heads. 4,446,897, Cl. 144-34.00R.

Kurihara, Norimitsu; and Imai, Takeshi, to Honda Giken Kogyo Kabushiki Kaisha. Method for integrating fuel consumption amount of vehicles. 4,446,727, Cl. 73-113.000.

Kurina, Miles J.; and Thornhill, John, to RCA Corporation. Stiffening clamp for self-erecting antenna. 4,447,816, Cl. 343-877.000.

Kurtz, Rudiger: *See*—
Bubik, Alfred; Dahl, Hans; Holik, Herbert; Kurtz, Rudiger; and Seider, Werner, 4,447,295, Cl. 162-300.000.

Kushmaul, Richard T.: *See*—
Lafevers, James O.; Kushmaul, Richard T.; and Scott, Ted R., 4,447,097, Cl. 312-215.000.

Kusumegi, Asao; Kondo, Kenjiro; Watase, Yoshiyuki; Yoshimura, Yoshio; and Miyake, Kozo, to National Laboratory for High Energy Physics. Radiation-shielding transparent material and method of producing the same. 4,447,734, Cl. 250-517.100.

Kybal, Jan: *See*—
Strnadova, Karin; Kybal, Jan; Svoboda, Eduard; and Spacil, Jiri, 4,447,540, Cl. 435-254.000.

Kyocera Corporation: *See*—
Inamori, Kazuo; and Hirabayashi, Masaya, 4,446,579, Cl. 3-1.910.

Labaw, Clifford S.; and Wellman, George R., to SK&F Lab Co. Use of N-cyano-N'-methyl-N"-[2-(5-methyl-4-imidazolylmethyldithio)ethyl]guanidine in the preparation of cimetidine. 4,447,621, Cl. 548-342.000.

La Fever, Alan E., to United States of America, National Aeronautics and Space Administration. Directional gear ratio transmissions. 4,446,757, Cl. 74-758.000.

Lafevers, James O.; Kushmaul, Richard T.; and Scott, Ted R. Dispenser cassette. 4,447,097, Cl. 312-215.000.

Laff, Robert A.: *See*—
Heidrich, Paul F.; Laff, Robert A.; and Light, Thomas B., 4,447,126, Cl. 350-96.310.

Lagodka, Gunter: *See*—
Becker, Kunibert; Dunkel, Gerd; Lagodka, Gunter; and Kirchbrucher, Rudiger, 4,447,174, Cl. 405-293.000.

Lagrange, Alain; and Rossello, Alain, to LCC. Cice-Compagnie Europeanne de Composants Electroniques. Dielectric ceramic composition on the base of thermally stable barium titanate and capacitor using such composition. 4,447,855, Cl. 361-321.000.

Lamb, Paul R.; Bakas, Steve T.; and Wood, Brian M., to UOP Inc. Hydrocracking process. 4,447,315, Cl. 208-99.000.

Lambert, David K., to General Motors Corporation. Electroreflectance vibrational spectroscopy. 4,446,719, Cl. 73-23.000.

Lamm, Klaus D.: *See*—
Fieber, Werner H.; Hinze, Klaus; Huth, Manfred K. O.; Jost, Hans-Georg; Lamm, Klaus D.; Michalski, Dieter; and Rittaler, Konstantin, 4,447,686, Cl. 200-153.00J.

Lamort, Jean-Pierre J., to E et M Lamort. Device for cleaning and recovering paper pulp. 4,447,320, Cl. 209-273.000.

Lamphere, William R., to Dionne, John B. Tool for removing stubborn nuts. 4,446,622, Cl. 30-272.00R.

Lancella, Attilio: *See*—
Ghigliotti, Giovanni; and Lancella, Attilio, 4,447,108, Cl. 339-256.0RT.

Land O'Lakes, Inc.: *See*—
Antenore, Donald E.; Schmadeke, Donald W.; and Stewart, Rodney A., 4,447,463, Cl. 426-603.000.

Landsman, Douglas A.: *See*—
Luczak, Francis J.; and Landsman, Douglas A., 4,447,506, Cl. 429-44.000.

Lang, Hans: *See*—
Schott, Eberhard P.; and Lang, Hans, 4,447,255, Cl. 71-86.000.

Langdon, Christopher J., to University of Delaware. Controlling undesired growth of mollusks. 4,447,411, Cl. 424-14.000.

Langer Biomechanics Group, Inc., The: *See*—
Jordan, R. Paul, 4,446,856, Cl. 128-80.00R.

Langerud, David S.: *See*—
Imerman, Curtis E.; Langerud, David S.; and Thomas, Brian H., 4,446,976, Cl. 212-189.000.

LaPotin, David P., to GTE Laboratories Incorporated. Waveform generating apparatus. 4,447,747, Cl. 307-529.000.

Larkin, Rodney B.: *See*—
Runnells, Robert R.; Haak, Peter A.; Larkin, Rodney B.; and Vandervelden, C. Keith, 4,447,399, Cl. 422-113.000.

Larranaga, Javier A., to Celaya, Emparanza Y Galdos S.A. (Cegasa). Contact in alkaline electric cells. 4,447,507, Cl. 429-54.000.

Larson, Donald R. Gate making tool. 4,446,894, Cl. 140-57.000.

Larson, Robert A.: *See*—
Segar, William R.; and Larson, Robert A., 4,447,680, Cl. 191-48.000.

Laue, Karl H.: *See*—
Wagener, Dietrich; Sander, Theo; and Laue, Karl H., 4,447,333, Cl. 210-750.000.

Laug, Reiner: *See*—
Botzem, Werner; Knappe, Ortwin; and Laug, Reiner, 4,447,730, Cl. 250-506.100.

Laurich-Trost, Victor R. Steering system for utility vehicle. 4,446,941, Cl. 180-236.000.

Lauterbach-Dammler, Inge: *See*—
Zollner, Dieter H.; Lauterbach-Dammler, Inge; and Rittmann, Friedrich, 4,447,300, Cl. 204-67.000.

Lauzanne-Morelle, Eliane M. T.: *See*—
Morelle, Jean V.; and Lauzanne-Morelle, Eliane M. T., 4,447,366, Cl. 260-501.110.

Lawrence, Jackson; Webb, Harry A.; and Frederick, John R., to Cluett, Peabody & Co., Inc. Continuous compressive preshrinking and drying method. 4,446,606, Cl. 26-18.600.

Lazay, Paul D.; Lemaire, Paul J.; and Pearson, Arthur D., to Bell Telephone Laboratories, Incorporated. Low dispension single mode fiber. 4,447,125, Cl. 350-96.300.

Lazik, Paul, to Rheinische Braunkohlenwerke AG. Process for separating sand from a brown coal or lignite material containing sand. 4,447,319, Cl. 209-11.000.

LCC. Cice-Compagnie Europeanne de Composants Electroniques: *See*—
Lagrange, Alain; and Rossello, Alain, 4,447,855, Cl. 361-321.000.

LeBlanc, John R.: *See*—
Cohen, Saul M.; and LeBlanc, John R., 4,447,594, Cl. 528-245.000.

Lech, Thaddeus, Jr., to Borg-Warner Corporation. Clutch driven plate assembly with a floating hub. 4,446,955, Cl. 192-106.200.

Lectromelt Corporation: *See*—
Persson, John A., 4,447,906, Cl. 373-72.000.

Le Deit, Gerard, to Societe Anonyme DBA. Sliding caliper disc brake. 4,446,947, Cl. 188-73.340.

Ledelec, Lucien; Guillaume, Jacques; and Dumont, Claude, to Roussel Uclaf. Dopaminergic stimulating piperidin-3-yl-indoles. 4,447,438, Cl. 424-267.000.

Lednicer, Daniel, to Upjohn Company, The. Analgetic compounds, compositions and process of treatment. 4,447,454, Cl. 424-330.000.

Lee, Guang-Huei, to Rhone-Poulenc Agrochimie. Herbicidal arylsulfonamide derivatives of phenoxybenzoic acids. 4,447,634, Cl. 560-13.000.

Lefebure, Jean M., to Thomson-CSF. Dot and dash segment display for simplified writing of Arabian language. 4,447,810, Cl. 340-756.000.

Lehmann, Gerard: *See*—
Bronicki, Lucien Y.; Hershman, Haim; and Lehmann, Gerard, 4,446,700, Cl. 60-641.800.

Lehr, Klaus: *See*—
Stephan, Hans-Werner; Klein, Hermann; and Lehr, Klaus, 4,447,400, Cl. 422-150.000.

Leib, Kenneth G., to Grumman Aerospace Corporation. Achromatic holographic element. 4,447,111, Cl. 350-3.700.

Leicht, Werner, to MTU-Motoren-und-Turbinen-Union Friedrichschafen GmbH. Sealing arrangement for fluid flow engines. 4,447,062, Cl. 277-3.000.

Leist, Theodore H., Jr.: *See*—
Thompson, Jack M., Jr.; and Leist, Theodore H., Jr., 4,446,742, Cl. 73-663.000.

Leithner, R.: *See*—
Reidick, H.; Leithner, R.; Kirchhoff, F. J.; Puritz, E.; and Schluter, S., 4,446,911, Cl. 165-4.000.

Lemaire, Paul J.: *See*—
Lazay, Paul D.; Lemaire, Paul J.; and Pearson, Arthur D., 4,447,125, Cl. 350-96.300.

Lenk, Pedro A.: *See*—
Elliott, George; Lenk, Pedro A.; and Shah, Jayantkumar R., 4,447,673, Cl. 179-18.0HB.

Lenke, Dieter: *See*—
Steiner, Gerd; Hofmann, Hans P.; Kreiskott, Horst; Teschendorf, Hans-Juergen; and Lenke, Dieter, 4,447,610, Cl. 544-381.000.

Leroy, Dominique L. J.; and Mazeau, Jean-Pierre, to Corning Glass Works. Lead aluminoborofluorosilicate moldable glasses. 4,447,550, Cl. 501-75.000.

Les Cables de Lyon: *See*—
Guazzo, Lucien; and Trezeguet, Jean-Pierre, 4,447,115, Cl. 350-96.200.

Leston, Gerd, to Koppers Company, Inc. Process for separating nitrated phenolic compounds from other phenolic compounds. 4,447,654, Cl. 568-708.000.

Leston, Gerd, to Koppers Company, Inc. Process for separating 3,5-xylenol or 3,4-xylenol from other polymethylated phenolic compounds. 4,447,658, Cl. 568-750.000.

Leung, Ka-Ngo; and Ehlers, Kenneth W., to United States of America, Energy. Ion source. 4,447,732, Cl. 250-427.000.

Leveen, Eric G.: *See*—
Leveen, Robert F.; and Leveen, Eric G., 4,446,867, Cl. 128-344.000.

Leveen, Robert F.; and Leveen, Eric G. Fluid-driven balloon catheter for intima fracture. 4,446,867, Cl. 128-344.000.

Lever Brothers Company: *See*—
Tai, Louis H. T., 4,447,349, Cl. 252-174.130.
Tyler, Frank S., 4,446,969, Cl. 206-519.000.

Levy, Leon: *See*—
Wolens, John; and Levy, Leon, 4,447,250, Cl. 46-1 F.

Lewis, David A.: *See*—
Lewis, Victor M.; and Lewis, David A., 4,447,460, Cl. 426-541.000.

Lewis, Henry G., Jr.; and Eliscu, Steven M., to RCA Corporation. Digital television receiver automatic chroma control system. 4,447,826, Cl. 358-27.000.

Lewis, Victor M.; and Lewis, David A. Processed vegetables. 4,447,460, Cl. 426-541.000.

Leybold Heraeus GmbH: *See*—
Oechsner, Hans, 4,447,724, Cl. 250-309.000.

Li, Hsueh M., to Ethyl Corporation. Phosphonitrilic chloride polymers. 4,447,408, Cl. 423-300.000.

Liberty Carton Co.: *See*—
Miller, LeRoy; Thorud, Stanley R.; and Rivkin, Eric M., 4,446,660, Cl. 52-36.000.

Libit, Sidney M. Tampering indicating bottle cap and method of closing a bottle. 4,446,981, Cl. 215-354.000.

Licciardello, Michael: *See*—
Boden, Richard M.; Licciardello, Michael; and Tyszkiewicz, Theodore J., 4,447,365, Cl. 260-463.000.

Licencia Talalmanyokat Ertekesito V.: *See*—
Molnar, Zoltan, 4,446,788, Cl. 100-117.000.

Licentia Patent-Verwaltungs G.m.b.H.: *See*—
Burkhardt, Gisbert, 4,446,962, Cl. 198-457.000.

Lidgard, Graham P.: *See*—
Ellis, James E.; Lidgard, Graham P.; Odstrchel, Gerald; and Riceberg, Louis J., 4,447,528, Cl. 435-7.000.

Lieb, Folker: *See*—
Oediger, Hermann; Lieb, Folker; and Disselnkotter, Hans, 4,447,367, Cl. 260-502.40R.

Liffmann, Stanley M.: *See*—
Neri, Bruce P.; and Liffmann, Stanley M., 4,447,544, Cl. 436-105.000.

Light, Thomas B.: *See*—
Heidrich, Paul F.; Laff, Robert A.; and Light, Thomas B., 4,447,126, Cl. 350-96.310.

Lileck, John T.: *See*—
Woytek, Andrew J.; Lileck, John T.; and Steigerwalt, Edward J., 4,446,920, Cl. 166-297.000.

Lin, Chiu-Hong: *See*—
Sih, John C.; and Lin, Chiu-Hong, 4,447,620, Cl. 548-336.000.

Lindauer Dornier Gesellschaft mbH: *See*—
Dornier, Peter, 4,446,632, Cl. 34-103.000.

Lindholm, Donald W. Excrement clean-up tool and bagger. 4,447,082, Cl. 294-1.0BA.

Lindquist, Rosaland O. Camouflaged nursing dress. 4,446,572, Cl. 2-104.000.

Lineair: *See*—
Cosaert, Marijke, 4,446,641, Cl. 40-152.000.

Linhart, Heinz; Modtler, Reiner; and Kratzsch, Eberhard, to Akzona Incorporated. Filament yarns of multicomponent fibers and utilization therefor in textile fabrics. 4,447,489, Cl. 428-225.000.

Lion, Charles E. Reduced noise monolithic wing-stabilizer aircraft. 4,447,022, Cl. 244-13.000.

List, Hans: *See*—
Denk, Heimo; Mantsch, Peter; and Moser, Werner, 4,447,742, Cl. 307-106.000.

Litton Systems, Inc.: *See*—
Buck, Ronald G., 4,447,693, Cl. 219-10.55M.
Gugliotti, Carmine, 4,447,101, Cl. 339-45.00M.
Rosenheck, Bernard M., 4,447,134, Cl. 350-358.000.

Liu, Chao-Min; Tresner, Homer D.; and Westley, John, to Hoffmann-La Roche Inc. Process to produce antibiotic X-14885A. 4,447,533, Cl. 435-119.000.

Lockheed Corporation: *See*—
Cronin, Michael J., 4,447,737, Cl. 290-6.000.
Simpson, William E., Jr., 4,446,890, Cl. 137-87.000.

Loeffler, Otto E.; Jain, Nirnal S.; and Kauder, Otto S., to Argus Chemical Corporation. Process for the preparation of thin films of cadmium sulfide and precursor solutions of cadmium ammonia thiocyanate complex useful therein. 4,447,335, Cl. 252-1.000.

Loewrigkeit, Peter: *See*—
Dabi, Shmuel; and Loewrigkeit, Peter, 4,447,571, Cl. 524-192.000.

Logan, Joseph S.; Mauer, John L., IV; Rothman, Laura B.; Schwartz, Geraldine C.; and Standley, Charles L., to International Business Machines Corporation. Planar multi-level metal process with built-in etch stop. 4,447,824, Cl. 357-71.000.

Logsdon, Gary L.: *See*—
Bolton, Brent C.; Hagenmaier, Carl F., Jr.; Logsdon, Gary L.; and Miner, Robert L., Jr., 4,447,875, Cl. 364-200.000.

Loire, Rene, to Morrison-Knudsen Company, Inc. Single point mooring and fender. 4,446,806, Cl. 114-219.000.

Long, David J.: *See*—
Oxenrider, Bryce C.; and Long, David J., 4,447,629, Cl. 556-419.000.

Long, Frederick G.: *See*—
Bean, Vern E.; and Long, Frederick G., 4,447,743, Cl. 307-118.000.

Long, Gary L.: *See*—
Bierman, Laurence W.; Long, Gary L.; and Bortner, David, 4,447,403, Cl. 423-20.000.

Long, Gary R.; and Dorsey, Robert J., to Wehr Corporation. Hydraulic refractory press including product thickness or density control means. 4,447,198, Cl. 425-140.000.

Lonsdale, Melvin J.: *See*—
Batterton, Elmo L.; and Lonsdale, Melvin J., 4,446,631, Cl. 34-65.000.

Loos, Patricia J.; Fuqua, Debra L.; and Drzewiecki, Paul J., to Procter & Gamble Company, The. Sauce compositions containing agglomerated particles of specified size distribution. 4,447,461, Cl. 426-589.000.

L'Oreal: *See*—
Gueret, Jean-Louis H., 4,446,879, Cl. 132-82.00B.
Gueret, Jean-Louis H.; and Arraudeau, Jean-Pierre, 4,446,880, Cl. 132-88.500.

Lothmann, Werner: *See*—
Kourimsky, Friedrich J. A.; and Lothmann, Werner, 4,447,102, Cl. 339-91.00R.

Lou, Perry W.: *See*—
Brantingham, George L.; Lou, Perry W.; Housey, Lawrence J.; Tubbs, Graham S.; and Teza, Jeffrey R., 4,447,881, Cl. 364-488.000.

Loucks, Terry L., to Environmental Testing & Certif. Corp. Shipping container. 4,446,705, Cl. 62-372.000.

Louthan, Rector P.: *See*—
Smith, Clifford E.; Mark, Harold W.; Louthan, Rector P.; and Efner, Howard F., 4,447,246, Cl. 144-57.000.

Lovgren, Anders, to HB Megaron. Apparatus for firing solid fuels. 4,446,800, Cl. 110-270.000.

Low, James K. Aquatic specimen retrieval frame. 4,446,749, Cl. 73-863.230.

Lubbock, Frederick J.; Mok, Christopher C. K.; and Eldridge, Robert J., to ICI Australia Limited; and Commonwealth Scientific and Industries Research Organization. Process for composite polymer beads. 4,447,475, Cl. 427-213.310.

Lubrizol Corporation, The: *See*—
Forsberg, John W., 4,447,348, Cl. 252-75.000.

Lucas Industries Limited: *See*—
Harrison, Anthony W., 4,446,882, Cl. 137-115.000.
Mowbray, Dorian F., 4,446,835, Cl. 123-450.000.

Lucas Industries Plc: *See*—
Worby, Donald, 4,447,194, Cl. 417-572.000.

Lucas Industries Public Limited Company: *See*—
Mowbray, Dorian F.; Fenne, Ivor; and Andrews, Richard J., 4,446,836, Cl. 123-450.000.

Lucas, Kenneth R.: *See*—
Price, William L.; Murtha, John C.; Ross, James A., Jr.; Adam, Clyde E.; and Lucas, Kenneth R., 4,447,873, Cl. 364-200.000.

Lucey, Desmond C., to Rolls-Royce Limited. Bladed rotor turning apparatus. 4,446,766, Cl. 81-480.000.

Lucker, Laurence H., Jr.: *See*—
Johnson, Charles A.; and Lucker, Laurence H., Jr., 4,446,807, Cl. 114-230.000.

Luczak, Francis J.; and Landsman, Douglas A., to United Technologies Corporation. Ternary fuel cell catalysts containing platinum, cobalt and chromium. 4,447,506, Cl. 429-44.000.

Ludwig, Gary R.: *See*—
Stumpf, William S.; and Ludwig, Gary R., 4,446,663, Cl. 52-144.000.

Luksch, Edmund: *See*—
Fink, Hans-Ferdi; Koerner, Gotz; and Luksch, Edmund, 4,447,498, Cl. 428-447.000.

Lula, James W.; and Schicker, James R., to United States of America, Energy. Method and composition for molding low density desiccant syntactic foam articles. 4,447,565, Cl. 523-219.000.

Lummus Company, The: *See*—
Russell, Charles M., 4,446,914, Cl. 165-129.000.

Lundberg, Robert D.; Walker, Thad O.; O'Farrell, Charles P.; and Makowski, Henry S., deceased (by Makowski, Patricia H., executrix), to Exxon Research and Engineering Co. Drilling mud viscosification agents based on sulfonated ionomers. 4,447,338, Cl. 252-8.50M.

Lundblad, Leif. Dual-purpose automatic apparatus for dispensing and depositing valuable papers and other documents, such as banknotes, cheques, receipts, vouchers etc. 4,447,714, Cl. 235-379.000.

Lunn, Richard H.: *See*—
Young, William E.; Lunn, Richard H.; and Archer, David H., 4,447,748, Cl. 310-11.000.

Lupton, Frank R.: *See*—
Forrest, William E.; and Lupton, Frank R., 4,446,944, Cl. 182-3.000.

Lussana, Riccardo; and Massenzana, Fabrizio, to Vitino Massenzana s.r.l. Device for holding paper close against a corrugating roller in a corrugated board-making machine. 4,447,285, Cl. 156-473.000.

Lustig, Stanley; Schuetz, Jeffrey M.; and Vicik, Stephen J., to Union Carbide Corporation. Shrinkable film for poultry bags. 4,447,480, Cl. 428-35.000.

LUWA AG: *See*—
Schmitt, Armin, 4,446,781, Cl. 99-483.000.

Luytea, Jacobus H., to Helmes Machinefabriek B.V. Double-sided tenoner. 4,446,899, Cl. 144-201.000.

Lydell, Donald J., deceased; and by Lydell, Hilda, executor. Splicing head for adding conductors to an electrical connector. 4,446,617, Cl. 29-861.000.

Lydell, Hilda, executor: *See*—
Lydell, Donald J., deceased; and Lydell, Hilda, executor, 4,446,617, Cl. 29-861.000.

Lysy, Dusan G.: *See*—
Snelling, Christopher; and Lysy, Dusan G., 4,447,145, Cl. 355-14.00D.

M.A.N. Maschinenfabrik Augsburg-Nurnberg A.G.: *See*—
Kotzur, Joachim; Reinersmann, Hans H.; Albers, Rolf; Aschenbruck, Emil; and Neuhaus, Gunter, 4,447,063, Cl. 277-80.000.

M.A.N. - Roland: *See*—
Abendroth, Paul; and Despot, Janko, 4,446,814, Cl. 118-694.000.

Machnee, Cecil; and Butuk, Fred N., to Morris Rod Weeder Co., Ltd. Air seeding boot. 4,446,801, Cl. 111-86.000.

MacInnis, Martin B.: *See*—
Vanderpool, Clarence D.; and MacInnis, Martin B., 4,447,404, Cl. 423-61.000.

MacNamee, Richard W.; Reese, Morris T.; and Blase, Emil F., to Sangamo Weston, Inc. Electrolyte system for electrolytic capacitors. 4,447,346, Cl. 252-62.200.

Maco-Meuden: *See*—
Emonet, Henri, 4,446,773, Cl. 91-317.000.

MacPherson, William F.: *See*—
Hartman, Adrian R.; Kohl, James E.; MacPherson, William F.; and Riley, Terence J., 4,447,744, Cl. 307-252.00R.

Madaus and Company: *See*—
Madaus, Rolf; and Stumpf, Werner, 4,447,455, Cl. 424-331.000.

Madaus, Rolf; and Stumpf, Werner, to Madaus and Company. Oral urolithiasis remedy. 4,447,455, Cl. 424-331.000.

Madden, William M.: *See*—
Wiley, Walter H.; and Madden, William M., 4,447,009, Cl. 239-265.390.

Maddoux, Lilla A. Animal medicine. 4,447,418, Cl. 424-165.000.

Madec, Francois; Delobelle, Emile; and Donvez, Georges, to Compagnie Generale des Etablissements Michelin. Tires for drive wheels of agricultural tractors or similar vehicles. 4,446,902, Cl. 152-209.00B.

Maeda, Masaya: *See*—
Hirata, Noritsugu; Takimoto, Hiroyuki; and Maeda, Masaya, 4,447,837, Cl. 360-33.100.

Maeda, Tadayuki: *See*—
Akiyama, Toru; Kamihigoshi, Tsutomu; Takagi, Shoji; and Maeda, Tadayuki, 4,447,663, Cl. 570-150.000.

Maeda, Yasunori; and Yamasaki, Akinobu, to Chugai Ro Co., Ltd. Proportional regulation oil burner of low pressure air type. 4,447,010, Cl. 239-414.000.

Maeda, Yuji: *See*—
Morioka, Akihiro; Maeda, Yuji; Matsumoto, Tetsuro; Yukinari, Masakazu; and Kishida, Eiichi, 4,447,309, Cl. 204-402.000.

Maeguchi, Kenji; and Tango, Hiroyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. SOS p—n Junction device with a thick oxide wiring insulation layer. 4,447,823, Cl. 357-23.000.

Maekawa, Masakazu; and Matsukawa, Hiroharu, to Fuji Photo Film Company, Limited. Heat-sensitive recording papers. 4,447,487, Cl. 346-200.000.

Magne, Robert: *See*—
Faure, Alphonse; and Magne, Robert, 4,447,631, Cl. 556-469.000.

Magorien, Vincent G., to Systron-Donner. Fluid line coupling with relief valve. 4,447,040, Cl. 251-149.800.

Maiocco, Giuseppe A., to Champion Spark Plug Italiana, S.p.A. Wiper blade and lateral connector. 4,446,589, Cl. 15-250.320.

Maitland, Peter: *See*—
Wise, Stanley S.; and Maitland, Peter, 4,446,950, Cl. 192-3.0TR.

Major, Clare M., personal representative: *See*—
Major, Frederick A., Jr., deceased; and Major, Clare M., personal representative, 4,447,107, Cl. 339-171.00E.

Major, Frederick A., Jr., deceased; and by Major, Clare M., personal representative. Collet for cable connector. 4,447,107, Cl. 339-171.00E.

MaK Maschinenbau GmbH: *See*—
Eggers, Manfred; and Zonak, Armin, 4,446,772, Cl. 89-37.00E.

Makino, Daisuke; and Miyadera, Yasuo, to Hitachi Chemical Company, Ltd. Method of preparing polyamide acid for processing of semiconductors. 4,447,596, Cl. 528-353.000.

Makino, Shigeo: *See*—
Endo, Kazuyuki; and Makino, Shigeo, 4,446,901, Cl. 152-209.00R.

Makowski, Henry S., deceased: *See*—
Lundberg, Robert D.; Walker, Thad O.; O'Farrell, Charles P.; and Makowski, Henry S., deceased, 4,447,338, Cl. 252-8.50M.

Makowski, Patricia H., executrix: *See*—
Lundberg, Robert D.; Walker, Thad O.; O'Farrell, Charles P.; and Makowski, Henry S., deceased, 4,447,338, Cl. 252-8.50M.

Malatesta, Vincenzo; Willis, Clive; and Hackett, Peter A., to Canadian Patents & Development Limited. Production of carbonyl fluoride. 4,447,304, Cl. 204-157.10R.

Maleski, Robert J.: *See*—
Krutak, James J.; and Maleski, Robert J., 4,447,624, Cl. 549-69.000.

Malhotra, Ripudaman: *See*—
Ross, David S.; Johnson, Robert M., Jr.; and Malhotra, Ripudaman, 4,447,662, Cl. 568-939.000.

Mallon, Charles B., to Union Carbide Corporation. Process for production of alkyl silicates from silicon metal. 4,447,632, Cl. 556-470.000.

Malthouse, Martin D. Labelling machine. 4,447,280, Cl. 156-85.000.

Mammel, Wanda L.: *See*—
Cohen, Leonard G.; Mammel, Wanda L.; and Marcuse, Dietrich, 4,447,127, Cl. 350-96.330.

Manasevit, Harold M., to Rockwell International Corporation. CVD Process for producing monocrystalline silicon-on-cubic zirconia and article produced thereby. 4,447,497, Cl. 428-446.000.

Mannes, Karl: *See*—
Werner, Friedrich; Mannes, Karl; and Trescher, Viktor, 4,447,647, Cl. 564-412.000.

Manteufel, Dale A., to Ingersoll Equipment Co., Inc. Self-elevating wood splitter and mounting arrangement. 4,446,898, Cl. 144-193.00A.

Mantsch, Peter: *See*—
Denk, Heimo; Mantsch, Peter; and Moser, Werner, 4,447,742, Cl. 307-106.000.

Maraghe, Alex, to Boeing Company, The. Cam operated counterbalance assembly for aircraft doors. 4,447,026, Cl. 244-129.500.

Marcus, Konrad H., to Prince Corporation. Rearview mirror transmitter assembly. 4,447,808, Cl. 340-696.000.

Marcus, Stephen; and Quist, Theodore M., to United States of America, Air Force. Pulsed laser radar apparatus. 4,447,149, Cl. 356-5.000.

Marcuse, Dietrich: *See*—
Cohen, Leonard G.; Mammel, Wanda L.; and Marcuse, Dietrich, 4,447,127, Cl. 350-96.330.

Mardin, Mithat: *See*—
Busse, Wolf-Dieter; Krauthausen, Edmund; and Mardin, Mithat, 4,447,440, Cl. 424-269.000.

Mark, Harold W.: *See*—
Smith, Clifford E.; Mark, Harold W.; Louthan, Rector P.; and Efner, Howard F., 4,447,246, Cl. 144-57.000.

Mark Products, Inc.: *See*—
Haggard, Samuel E., 4,447,104, Cl. 339-103.00M.

Markarian, Paul M., to Sprague Electric Company. Oval dual-AC-capacitor package. 4,447,854, Cl. 361-329.000.

Markovich, Mark J., to Welsh Sporting Goods Corp. Firearm carrying case. 4,446,900, Cl. 150-52.00R.

Marks, Robert; Phelps, Douglas W., Jr.; and Ward, William C., to International Business Machines Corporation. Substrate with multiple type connections. 4,447,857, Cl. 361-395.000.

Marples, Thomas N. R.: *See*—
Hughes, Alan C.; Copeman, Richard C.; and Marples, Thomas N. R., 4,447,254, Cl. 71-67.000.

Marquardt, Erich; and Sachs, Ekkehard, to Marquardt GmbH. Push-button switch. 4,447,687, Cl. 200-159.00R.

Marquardt GmbH: *See*—
Marquardt, Erich; and Sachs, Ekkehard, 4,447,687, Cl. 200-159.00R.

Marshall, Duane: *See*—
Rines, Carol M.; and Marshall, Duane, 4,447,168, Cl. 400-708.000.

Marshall, Norman B., to Upjohn Company, The. Methods of treating ischemic states. 4,447,449, Cl. 424-304.000.

Marsili, Leonardo: *See*—
Franceschi, Giovanni; Marsili, Leonardo; Sanfilippo, Aurora; and Vioglio, Sergio, 4,447,432, Cl. 424-248.540.

Marsoner, Hermann J.; and Savora, Gunther, to AVL AG. Method and apparatus for determining systolic time intervals. 4,446,872, Cl. 128-700.000.

Martel, Jacques; Buendia, Jean; and Nierat, Jeanine, to Roussel Uclaf. Epimerization of trans chrysanthemates. 4,447,637, Cl. 560-124.000.

Martin, Charles A. Fireplace outside air inlet. 4,446,847, Cl. 126-120.000.

Martin, Keith S., to Scovill Inc. Container having sight glass. 4,446,731, Cl. 73-334.000.

Martin, Patrick H.: *See*—
Caskey, Terrence L.; Parker, Theodore L.; and Martin, Patrick H., 4,447,598, Cl. 528-489.000.

Martin, Roy T., to Walter Kidde & Co., Inc. Removal of explosive or combustible gas or vapors from tanks and other enclosed spaces. 4,446,923, Cl. 169-45.000.

Martini, Thomas; Schinzel, Erich; Frischkorn, Hans; Friedrich, Herbert; and Probst, Heinz, to Hoechst Aktiengesellschaft. Mixtures of optical brighteners and their use. 4,447,350, Cl. 252-301.220.

Marx, Hans-Jurgen; and Hosel, Fritz P., to Trutzschler GmbH & Co. KG. Machine operator protection system. 4,446,602, Cl. 19-0.210.

Marx, Matthias: *See*—
Horn, Peter; Gehm, Robert; Marx, Matthias; and Roeber, Artur, 4,447,561, Cl. 521-118.000.

Masai, Hiroto, to Aisin Seiki Kabushiki Kaisha. Viscous fluid coupling assembly. 4,446,952, Cl. 192-58.00B.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Hagin, Faust; and Drewitz, Hans J., 4,446,756, Cl. 74-687.000.

Mashida, Toru; and Matsushita, Sumeo. Method of producing decorative objects. 4,447,473, Cl. 427-162.000.

Maskalick, Nicholas J., to United States of America, Energy. Pre-plated reactive diffusion-bonded battery electrode plaques. 4,447,509, Cl. 429-235.000.

Mason, Carl J.: *See*—
Klayman, Daniel L.; Scovill, John P.; Bartosevich, Joseph F.; Mason, Carl J.; and Griffin, T. Scott, 4,447,427, Cl. 424-244.000.

Mason, Robert L.: *See*—
Souder, James J., Jr.; Scarborough, Edward D., Jr.; Fox, Merlin D.; Rettich, Donald R.; and Mason, Robert L., 4,447,031, Cl. 248-280.100.

Massenzana, Fabrizio: *See*—
Lussana, Riccardo; and Massenzana, Fabrizio, 4,447,285, Cl. 156-473.000.

Massey-Ferguson Inc.: *See*—
Stone, Lawrence J.; and Wells, Richard J., 4,447,860, Cl. 362-30.000.

Massey, William A., to General Electric Company. Negative sequence network having a frequency compensated filter. 4,447,843, Cl. 361-76.000.

Masson, Serge: *See*—
Kalbskopf, Reinhard; Baumberger, Otto; and Masson, Serge, 4,446,815, Cl. 118-718.000.

Massonnet, Henry. Two-position easy chair. 4,447,087, Cl. 297-130.000.

Mastic Corporation: *See*—
Schoolman, William K.; Griman, George A.; and Andrews, Frank D., 4,446,654, Cl. 49-181.000.

Masuda, Yutaka, to Yamaha Hatsudoki Kabushiki Kaisha. Trouble shooting method of vehicles. 4,447,801, Cl. 340-52.00F.

Masui, Saburo, to Yasui Sangyo Co., Ltd. Vehicle lift. 4,447,042, Cl. 254-90.000.

Masujima, Sho; Shibuya, Masahide; Shoichi, Iwaya; Umeda, Kenichi; Oikawa, Yasunobu; Abe, Hisao; Midori, Yoshifumi; Fujiwara, Shinobu; and Kikuchi, Nobuaki, to TDK Kabushiki Kaisha. Non-linear dielectric element. 4,447,549, Cl. 501-138.000.

Matey, James R., to RCA Corporation. Apparatus and method for making a video disc. 4,447,381, Cl. 264-107.000.

Matheson, Neil, III, to Graham Magnetics Incorporated. Conductor powders. 4,447,274, Cl. 148-6.240.

Mathis, Ronald D.; and Reed, Jerry A., to Phillips Petroleum Company. Method for adjusting arylene sulfide polymer cure rates. 4,447,597, Cl. 528-388.000.

Matkan, Josef, to Research Hildings Pty. Limited. Dry toner and method of making same. 4,447,516, Cl. 430-109.000.

Matoba, Kazunari: *See*—
Kataoka, Kenzo; Nishimoto, Shinichi; and Matoba, Kazunari, 4,447,207, Cl. 433-69.000.

Matsuchita Electric Industrial Co., Ltd.: *See*—
Ogawa, Kazufumi; Chikamura, Takao; and Shibata, Takuo, 4,447,720, Cl. 250-211.00J.

Matsuda, Eugene: *See*—
Huey, Wai J.; Murman, Fernando; and Matsuda, Eugene, 4,447,037, Cl. 251-1.00B.

Matsuda, Hideaki: *See*—
Kanaoka, Kunio; Okamoto, Takanori; and Matsuda, Hideaki, 4,447,563, Cl. 523-176.000.

Matsui, Masanao; and Ogawa, Tomoya, to Rikagaku Kenkyusho. Di(-tri-lower alkylstannyl)pyrimidine derivative and a process for producing the same. 4,447,605, Cl. 544-225.000.

Matsukawa, Hiroharu: *See*—
Mackawa, Masakazu; and Matsukawa, Hiroharu, 4,447,487, Cl. 346-200.000.

Matsukuma, Yutaka: *See*—
Takahashi, Yoshihiro; Okuyama, Katsuo; and Matsukuma, Yutaka, 4,447,856, Cl. 361-383.000.

Matsumoto, Michio; Kitamura, Masao; Ohta, Masataka; and Ohshima, Takeshi, to Nippon Electric Co., Ltd.; and Nippon Telegraph & Telephone Public Corporation. Dot matrix printer. 4,446,789, Cl. 101-93.040.

Matsumoto, Nobuyuki: *See*—
Miyahra, Katsunobu; and Matsumoto, Nobuyuki, 4,447,677, Cl. 179-107.00R.

Matsumoto, Tetsuro: *See*—
Morioka, Akihiro; Maeda, Yuji; Matsumoto, Tetsuro; Yukinari, Masakazu; and Kishida, Eiichi, 4,447,309, Cl. 204-402.000.

Matsumura, Satoru: *See*—
Watanabe, Masaru; Matsumura, Satoru; Amada, Takayoshi; Irie, Hiromitsu; and Saito, Norihisa, 4,447,293, Cl. 159-6.200.

Matsumura, Toshimi; Fujisawa, Hideya; Omori, Norio; Arimura, Takashi; Yamazoe, Hisamitsu; and Nishiura, Kiyotaka, to Nippondenso Co., Ltd. Method and system for controlling the idle speed of an internal combustion engine at variable ignition timing. 4,446,832, Cl. 123-339.000.

Matsunaga, Isao: *See*—
Tanemura, Mitsura; Yamazaki, Tamotsu; Mizuno, Koji; Kaiho, Shin-ichi; Kakimoto, Morio; Hoshino, Eiichi; Matsunaga, Isao; and Hata, Shun-ichi, 4,447,453, Cl. 424-319.000.

Matsuo, Yoshio, to Tetsudo Kizai Kogyo Company Limited. Cam type elastic rail fastening device. 4,447,006, Cl. 238-341.000.

Matsuoka, Fumio: *See*—
Yamazaki, Kisuke; Iijima, Hitoshi; Matsuoka, Fumio; and Nishizawa, Toshizo, 4,446,704, Cl. 62-180.000.

Matsuoka, Kazuhiko; and Minoura, Kazuo, to Canon Kabushiki Kaisha. Scanning optical system having a tilting correcting function. 4,447,112, Cl. 350-6.500.

Matsushita Electric Industrial Co., Ltd.: *See*—
Horii, Kenju, 4,447,735, Cl. 250-578.000.
Kadota, Hiroshi, 4,447,891, Cl. 365-154.000.
Mizukawa, Takumi; Amagami, Keizo; and Kobayashi, Takao, 4,447,691, Cl. 219-10.49R.
Nakada, Seiichi; Ohno, Hiroshi; Nishijima, Tsuneo; and Kawakami, Hiroshi, 4,446,595, Cl. 15-365.000.
Saimi, Tetsuo, 4,447,722, Cl. 250-216.000.

Matsushita, Sumeo: *See*—
Mashida, Toru; and Matsushita, Sumeo, 4,447,473, Cl. 427-162.000.

Matsushita, Yukio; and Nozaki, Toshikatsu, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Fuel injection apparatus for an internal combustion engine. 4,446,833, Cl. 123-435.000.

Matt, Timothy S., to Nordson Corporation. Method for automatically coating objects with a plurality of quantities of a coating material using a single discharge apparatus. 4,447,465, Cl. 427-10.000.

Matthews, James A., to Intel Corporation. CMOS Process with unique plasma etching step. 4,447,290, Cl. 156-626.000.

Mauer, John L., IV: *See*—
Logan, Joseph S.; Mauer, John L., IV; Rothman, Laura B.; Schwartz, Geraldine C.; and Standley, Charles L., 4,447,824, Cl. 357-71.000.

Mauri, Jacinto M.: *See*—
Spickett, Robert G. W.; Mauri, Jacinto M.; and Puchades, Jesus E. B., 4,447,417, Cl. 424-156.000.

Max Kammerer GmbH: *See*—
Schiller, Werner, 4,447,689, Cl. 200-330.000.

Maxwell AG: *See*—
Maxwell, Anthony J., 4,446,892, Cl. 138-104.000.

Maxwell, Anthony J., to Maxwell AG. Method and apparatus for monitoring lengths of hose. 4,446,892, Cl. 138-104.000.

May, Adolf; and Bucking, Hans-Walter, to Hoechst Aktiengesellschaft. Concentrated fabric softeners. 4,447,343, Cl. 252-8.750.

Mayfield, William B., to Parker-Hannifin Corporation. Medication infusion pump. 4,447,233, Cl. 604-152.000.

Mayfield, William B., to Parker-Hannifin Corporation. Medication infusion pump. 4,447,234, Cl. 604-151.000.

Mayoral, Armando G. Surgical aspirator valve apparatus. 4,447,226, Cl. 604-73.000.

Mazeau, Jean-Pierre: *See*—
Leroy, Dominique L. J.; and Mazeau, Jean-Pierre, 4,447,550, Cl. 501-75.000.

McClain, James L., to McDermott Incorporated. Roller support for load handling devices. 4,446,977, Cl. 212-247.000.

McCleery, Winston T. Computer environment protector. 4,447,846, Cl. 361-90.000.

McClure, Leon C.; and McClure, Stanley, Sr. Boom with energy absorbing vibration damper. 4,446,928, Cl. 172-776.000.

McClure, Stanley, Sr.: *See*—
McClure, Leon C.; and McClure, Stanley, Sr., 4,446,928, Cl. 172-776.000.

McConnell, James A.: *See*—
Shanklin, Frank G.; and McConnell, James A., 4,447,284, Cl. 156-366.000.

McCrary, Paul T., to Ford Motor Company. Clutch stroke control metering valve for an automatic transmission. 4,446,759, Cl. 74-867.000.

McCurdy, H. Dennis: *See*—
Gay, John C.; McCurdy, H. Dennis; and Rose, Wayne B., 4,447,414, Cl. 424-81.000.

McDermott Incorporated: *See*—
McClain, James L., 4,446,977, Cl. 212-247.000.

McDonald, Thomas K.: *See*—
Kirchner, Charles H., Jr.; and McDonald, Thomas K., 4,446,590, Cl. 15-302.000.

McElroy, Lucian G. Nozzle assembly. 4,446,592, Cl. 15-316.00R.

McFarland, Robert H., to Tappan Company, The. Vent apparatus for a surface cooking appliance. 4,446,849, Cl. 126-299.00R.

McGraw-Edison Company: *See*—
Heinrichs, Frank W., 4,447,796, Cl. 336-60.000.

McGregor, Charles W.: *See*—
Minnick, Michael G.; Connell, James J.; and McGregor, Charles W., 4,447,472, Cl. 427-120.000.

McGroddy, James C.: *See*—
Fang, Frank F.; and McGroddy, James C., 4,447,746, Cl. 307-311.000.

McGuiggan, Michael F.; and Kuch, Philip L., to Standard Oil Company, The. Process for the production of hydrogen and carbonyl sulfide from hydrogen sulfide and carbon monoxide using a metal boride, nitride, carbide and/or silicide catalyst. 4,447,409, Cl. 423-416.000.

McKaveney, James P., to Occidental Chemical Corporation. Articles having an electrically conductive surface. 4,447,492, Cl. 428-328.000.

McKenchnie Chemicals Limited: *See*—
Hughes, Alan C.; Copeman, Richard C.; and Marples, Thomas N. R., 4,447,254, Cl. 71-67.000.

McLellan, Edward J.; and Webb, John A., to United States of America, Energy. Method and apparatus for fast laser pulse detection using gaseous plasmas. 4,447,151, Cl. 356-218.000.

McRae, Daniel D.: *See*—
Smith, Earl F.; and McRae, Daniel D., 4,447,910, Cl. 375-99.000.

McWilliams, John P., to Mobil Oil Corporation. Para-selective alkylation catalysts and processes. 4,447,666, Cl. 585-467.000.

McWilliams, Joseph A., to Micropore International Limited. Electric cookers incorporating radiant heaters. 4,447,710, Cl. 219-449.000.

MDT Chemical Company: *See*—
Runnells, Robert R.; Haak, Peter A.; Larkin, Rodney B.; and Vandervelden, C. Keith, 4,447,399, Cl. 422-113.000.

MEAB, Mobile Equipment AB: *See*—
Sandered, Bror; Carlsson, Rune; and Andersson, Bengt, 4,447,013, Cl. 242-54.00R.

Mead Corporation, The: *See*—
Floyd, Raymond C., 4,447,038, Cl. 251-1.00B.
Kistner, Oscar J., 4,447,002, Cl. 229-37.00R.

Meckler, Gershon. Air conditioning apparatus. 4,446,774, Cl. 98-38.00D.

Meeker, G. William. Triangle and pyramid signal transforms and apparatus. 4,447,886, Cl. 364-725.000.

Mei, Joseph S.: *See*—
Shang, Jer-Yu; Notestein, John E.; Mei, Joseph S.; and Zeng, Li-Wen, 4,447,297, Cl. 202-99.000.

Meibos, Harold R.: *See*—
Yunker, Conrad E.; Cory, John C.; and Meibos, Harold R., 4,447,537, Cl. 435-235.000.

Meiers, Gerald F.: *See*—
Frimml, Roger W.; and Meiers, Gerald F., 4,446,684, Cl. 56-341.000.

Mein, Peter G., to Carus Corporation. Process for recovering cesium from cesium ore. 4,447,406, Cl. 423-198.000.

Meixner, Peter: *See*—
Kersten, Peter; Meixner, Peter; Muller, Erich; and Horing, Eckart, 4,447,165, Cl. 384-428.000.

Melinat, Wolfgang, to General Motors Corporation. Disc brake caliper mount. 4,446,948, Cl. 188-73.450.

Menache-Aronson, Doris; Kosow, David P.; Orthner, Carolyn L.; and Behre, H. Evan, to American National Red Cross. Plasma protein concentrates of reduced thrombogenicity and their use in clinical replacement therapy. 4,447,416, Cl. 424-101.000.

Mendiratta, Ashok K., to General Electric Company. Purification of bisphenol-A. 4,447,655, Cl. 568-724.000.

Merck & Co., Inc.: *See*—
Firestone, Raymond A.; Cama, Lovji D.; and Christensen, Burton G., 4,447,602, Cl. 544-21.000.
Goldenberg, Marvin M., 4,447,443, Cl. 424-273.00R.

Merrell Dow Pharmaceuticals Inc.: *See*—
Grisar, J. Martin; Schnettler, Richard A.; and Dage, Richard C., 4,447,619, Cl. 548-318.000.

Merritt, Paul H.; and Fuller, Francis W., to Caterpillar Tractor Co. Apparatus and method for forming an external guard member on a hose. 4,446,607, Cl. 29-33.00E.

Merten, Rudolf: *See*—
Hocker, Jurgen; Dhein, Rolf; and Merten, Rudolf, 4,447,583, Cl. 525-328.100.

Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
Bock, Siegfried; and Huetter, Horst, 4,447,025, Cl. 244-118.200.

Mestdagh, Gilbert E.: *See*—
Mignolet, Georges M. A.; and Mestdagh, Gilbert E., 4,447,840, Cl. 360-137.000.

Metal Box Limited: *See*—
Reed, Leonard W.; Barr, Robert M. S.; and Dick, David A., 4,447,199, Cl. 425-182.000.

Mewes, Claus J., to Prometag AG. Article-inserting station for packing machine. 4,446,675, Cl. 53-535.000.

Meyer, Louis C.; and Goodenough, Samuel H., to Mitral Medical International, Inc. Artificial heart valve. 4,446,577, Cl. 3-1.500.

Meyer Morton Company: *See*—
Batterton, Elmo L.; and Lonsdale, Melvin J., 4,446,631, Cl. 34-65.000.

Mezawa, Tsutomu: *See*—
Takemae, Yoshihiro; Enomoto, Seiji; Nozaki, Shigeki; Mezawa, Tsutomu; and Kabashima, Katsuhiko, 4,447,745, Cl. 307-269.000.

Mhlume (Swaziland) Sugar Company Limited: *See*—
Robinson, David S.; and Taylor, Rupert M., 4,447,185, Cl. 414-420.000.

Michalski, Dieter: *See*—
Fieber, Werner H.; Hinze, Klaus; Huth, Manfred K. O.; Jost, Hans-Georg; Lamm, Klaus D.; Michalski, Dieter; and Rittaler, Konstantin, 4,447,686, Cl. 200-153.00J.

Michel, Yves C.: *See*—
Chekroun, Claude D.; and Michel, Yves C., 4,447,815, Cl. 343-754.000.

Micropore International Limited: *See*—
McWilliams, Joseph A., 4,447,710, Cl. 219-449.000.

Midooka, Masanori: *See*—
Katagiri, Masayoshi; Kondo, Toshio; and Midooka, Masanori, 4,447,066, Cl. 277-212.0FB.

Midori, Yoshifumi: *See*—
Masujima, Sho; Shibuya, Masahide; Shoichi, Iwaya; Umeda, Kenichi; Oikawa, Yasunobu; Abe, Hisao; Midori, Yoshifumi; Fujiwara, Shinobu; and Kikuchi, Nobuaki, 4,447,549, Cl. 501-138.000.

Mierzwinski, Eugene P., to Essex Group, Inc. Control system with interactive display. 4,447,692, Cl. 219-10.55B.

Mignolet, Georges M. A.; and Mestdagh, Gilbert E., to U.S. Philips Corporation. 2-Speed magnetic-tape cassette apparatus. 4,447,840, Cl. 360-137.000.

Miho, Takuya: *See*—
Watanabe, Shoji; and Miho, Takuya, 4,447,591, Cl. 528-80.000.

Miles Laboratories, Inc.: *See*—
Gantzer, Mary L., 4,447,542, Cl. 436-66.000.
Greenquist, Alfred C.; Rupchock, Patricia A.; Tyhach, Richard J.; and Walter, Bert, 4,447,529, Cl. 435-7.000.
Rupchock, Patricia A.; and Tyhach, Richard J., 4,447,526, Cl. 435-7.000.
Staal, Philip W., 4,447,364, Cl. 260-448.00R.

Miller, J. Wayne; and Simpson, Howard D., to Union Oil Company of California. Hydroprocessing with lithium-containing catalyst. 4,447,317, Cl. 208-216.00R.

Miller, LeRoy; Thorud, Stanley R.; and Rivkin, Eric M., to Liberty Carton Co. Stuctural member storage device. 4,446,660, Cl. 52-36.000.

Miller, Richard C.: *See*—
Dixon, Richard W.; Koszi, Louis A.; Miller, Richard C.; and Schwartz, Bertram, 4,447,905, Cl. 372-46.000.

Miller, Russell S.; Dietz, Peter W.; and Bray, Christopher, to General Electric Company. Two-phase thermal storage means and method. 4,446,910, Cl. 165-1.000.

Milliken Research Corporation: *See*—
Ott, David A., 4,446,974, Cl. 211-45.000.
Warner, Charles E., 4,446,690, Cl. 57-284.000.
Warner, Charles E., 4,446,691, Cl. 57-284.000.

Mima, Hiroshi, to Murata Kikai Kabushiki Kaisha. Pneumatic yarn splicing apparatus for splicing core spun yarns. 4,446,687, Cl. 57-22.000.

Miner, Robert L., Jr.: *See*—
Bolton, Brent C.; Hagenmaier, Carl F., Jr.; Logsdon, Gary L.; and Miner, Robert L., Jr., 4,447,875, Cl. 364-200.000.

Ministry of International Trade and Industry: *See*—
Ebata, Yoshihiro; Kose, Saburo; and Hayami, Ryozo, 4,447,283, Cl. 156-325.000.

Minnesota Mining and Manufacturing Company: *See*—
Driscoll, William A.; Heilmann, Steven M.; and Rasmussen, Jerald K., 4,447,493, Cl. 428-332.000.
Nothaft, Eugene M., 4,447,872, Cl. 364-200.000.
Rametta, Anthony J., 4,447,588, Cl. 526-301.000.
Tiers, George V. D.; Aasen, Steven M.; Dalzell, Rex J.; and Holmes, Brian N., 4,447,521, Cl. 430-337.000.
Vallarino, Angelo; and Vittore, Lorenzo, 4,447,525, Cl. 430-539.000.

Minnick, Michael G.; Connell, James J.; and McGregor, Charles W., to Essex Group, Inc. Magnet wire coating method and article. 4,447,472, Cl. 427-120.000.

Minolta Camera Kabushiki Kaisha: *See*—
Nakamura, Akiyoshi, 4,447,135, Cl. 350-426.000.
Tabuchi, Kenji, 4,447,518, Cl. 430-122.000.

Yuge, Shizuo; Sakakibara, Susumu; Ishikawa, Takuma; Kito, Nobuo; and Yamamoto, Toshio, 4,447,517, Cl. 430-122.000.

Minolta Kabushiki Kaisha: *See—*
Imura, Kenji, 4,446,871, Cl. 128-633.000.

Minoura, Kazuo: *See—*
Matsuoka, Kazuhiko; and Minoura, Kazuo, 4,447,112, Cl. 350-6.500.

Miracle Recreation Equipment Company: *See—*
Ahrens, Paul W., 4,447,055, Cl. 272-113.000.

Mishima Kosan Corporation: *See—*
Ushio, Tetsuji; Tatsuguchi, Satoru; Otani, Toshihisa; Tani, Hoshiro; and Yabe, Tetsuo, 4,447,306, Cl. 204-224.00R.

Mita Industrial Co., Ltd.: *See—*
Miyakawa, Nobuhiro; Higashiguchi, Teruaki; Sano, Yumiko; and Funato, Masatomi, 4,447,513, Cl. 430-58.000.
Nakazawa, Toru; Fushida, Akira; and Kamezaki, Yasushi, 4,447,514, Cl. 430-81.000.

Mitamura, Gen; Eguchi, Takao; and Nagami, Yukio, to Seiko Instruments & Electronics Ltd. Watchcase. 4,447,162, Cl. 368-295.000.

Mitral Medical International, Inc.: *See—*
Meyer, Louis C.; and Goodenough, Samuel H., 4,446,577, Cl. 3-1.500.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Endo, Norio; Asayama, Yoshiaki; and Kabuto, Masami, 4,446,824, Cl. 123-52.00M.
Fujita, Shozo; Futatsuishi, Shunichi; and Takushima, Takashi, 4,446,643, Cl. 40-590.000.
Kajiyama, Ryuichi; and Yonemoto, Masashi, 4,446,946, Cl. 187-29.00R.
Mizuno, Takaji; Suwahara, Hiroshi; and Segawa, Hirohisa, 4,447,702, Cl. 219-130.330.
Niwa, Yoshiei, 4,447,696, Cl. 219-69.00P.
Tsurumoto, Kazuo; and Ozaki, Yoshio, 4,447,713, Cl. 219-69.00G.
Yamazaki, Kisuke; Iijima, Hitoshi; Matsuoka, Fumio; and Nishizawa, Toshizo, 4,446,704, Cl. 62-180.000.

Mitsubishi Jidosha Kogyo K.K.: *See—*
Endo, Norio; Asayama, Yoshiaki; and Kabuto, Masami, 4,446,824, Cl. 123-52.00M.

Mitsubishi Kasei Kogyo Kabushiki Kaisha: *See—*
Omae, Yoshihiro; Okubo, Noboru; Sigyo, Keiichi; Nakajima, Hideo; Fukui, Hiroaki; Yamada, Toshio; and Honda, Hideyuki, 4,447,805, Cl. 340-539.000.

Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
Kimura, Etsuji; Ogi, Katsumi; Sato, Kazusuke; and Hashimoto, Mayuki, 4,447,045, Cl. 266-149.000.
Sugizawa, Taijiro; Yoshimura, Hironori; and Toyama, Junichi, 4,447,263, Cl. 75-233.000.

Mitsubishi Mining & Cement Company, Ltd.: *See—*
Tomuro, Noboru; Ishiguchi, Isao; Tsujikawa, Shinjiro; Kashima, Masao; and Miyashita, Yasuo, 4,447,853, Cl. 361-321.000.

Mitsubishi Paper Mills, Ltd.: *See—*
Uno, Akira; Noda, Touru; and Ninohira, Akira, 4,447,524, Cl. 430-538.000.

Mitsubishi Plastics Industries Limited: *See—*
Aritake, Toshiyuki, 4,447,485, Cl. 428-144.000.

Mitsubishi Rayon Co., Ltd.: *See—*
Tamura, Hitoshi; and Shigeoka, Katsuhei, 4,447,384, Cl. 264-206.000.

Miyadera, Yasuo: *See—*
Makino, Daisuke; and Miyadera, Yasuo, 4,447,596, Cl. 528-353.000.

Miyahra, Katsunobu; and Matsumoto, Nobuyuki, to Sony Corporation. Hearing aid. 4,447,677, Cl. 179-107.00R.

Miyakawa, Nobuhiro; Higashiguchi, Teruaki; Sano, Yumiko; and Funato, Masatomi, to Mita Industrial Co., Ltd. Photosensitive material for electrophotography. 4,447,513, Cl. 430-58.000.

Miyake, Kozo: *See—*
Kusumegi, Asao; Kondo, Kenjiro; Watase, Yoshiyuki; Yoshimura, Yoshio; and Miyake, Kozo, 4,447,734, Cl. 250-517.100.

Miyamoto, Akio, to Fuji Photo Film Co., Ltd. Pressure-sensitive recording material. 4,447,075, Cl. 346-213.000.

Miyamoto, Masafumi: *See—*
Ogura, Shunichiro; and Miyamoto, Masafumi, 4,447,318, Cl. 208-348.000.

Miyashita, Yasuo: *See—*
Tomuro, Noboru; Ishiguchi, Isao; Tsujikawa, Shinjiro; Kashima, Masao; and Miyashita, Yasuo, 4,447,853, Cl. 361-321.000.

Miyoshi, Taisuke, to Seiko Instruments & Electronics Ltd. Electrochromic device. 4,447,133, Cl. 350-357.000.

Mizoguchi, Masayuki: *See—*
Kojima, Takafumi; Yoshida, Shigeru; and Mizoguchi, Masayuki, 4,447,679, Cl. 179-175.30R.

Mizuhara, Howard, to GTE Products Corporation. Brazing alloy containing reactive metals, precious metals, boron and nickel. 4,447,391, Cl. 420-456.000.

Mizuhara, Howard, to GTE Products Corporation. Ductile silver based brazing alloys containing a reactive metal and manganese or germanium or mixtures thereof. 4,447,392, Cl. 420-501.000.

Mizukawa, Takumi; Amagami, Keizo; and Kobayashi, Takao, to Matsushita Electric Industrial Company, Limited. Circuit for detecting a utensil load placed asymmetrically relative to an induction heating coil. 4,447,691, Cl. 219-10.49R.

Mizuno, Koji: *See—*
Tanemura, Mitsura; Yamazaki, Tamotsu; Mizuno, Koji; Kaiho, Shin-ichi; Kakimoto, Morio; Hoshino, Eiichi; Matsunaga, Isao; and Hata, Shun-ichi, 4,447,453, Cl. 424-319.000.

Mizuno, Takaji; Suwahara, Hiroshi; and Segawa, Hirohisa, to Mitsubishi Denki Kabushiki Kaisha. DC Arc welding apparatus having variable current response. 4,447,702, Cl. 219-130.330.

Mizuta, Hiroyuki: *See—*
Nishimura, Haruki; Naruto, Shunsuke; Mizuta, Hiroyuki; Kadokawa, Toshiaki; and Kawashima, Katsuyoshi, 4,447,439, Cl. 424-267.000.

Mizutani, Hidemi: *See—*
Suzuki, Fumio; Fujikawa, Yoshihiro; Yamamoto, Susumu; Mizutani, Hidemi; Ohya, Tunehiko; Ikai, Takashi; and Oguchi, Toshihiko, 4,447,256, Cl. 71-86.000.

Mobil Oil Corporation: *See—*
Angevine, Philip J.; Audeh, Costandi A.; Tabak, Samuel A.; and Yan, Tsoung Y., 4,447,312, Cl. 208-46.000.
Banta, Frederick, 4,447,314, Cl. 208-89.000.
Crisman, Robert W.; and DeAngelis, Dominick, 4,447,332, Cl. 210-748.000.
Derbyshire, Francis J.; and Whitehurst, Darrell D., 4,447,310, Cl. 208-8.0LE.
Fowles, Patrick E.; Shoemaker, Gerald L.; and Yan, Tsoung-Yuan, 4,447,311, Cl. 208-35.000.
Gorring, Robert L.; and Smith, Robert L., 4,447,313, Cl. 208-86.000.
McWilliams, John P., 4,447,666, Cl. 585-467.000.
Russo, Robert V., 4,447,575, Cl. 524-484.000.
Wagner, John R., Jr.; and Hein, Carl C., 4,447,494, Cl. 428-349.000.
Young, Lewis B., 4,447,642, Cl. 560-247.000.

Mochida, Ei: *See—*
Ohnishi, Haruo; Itoh, Chihiro; and Mochida, Ei, 4,447,437, Cl. 424-263.000.

Mochida Pharmaceutical Co., Ltd.: *See—*
Ohnishi, Haruo; Itoh, Chihiro; and Mochida, Ei, 4,447,437, Cl. 424-263.000.

Modtler, Reiner: *See—*
Linhart, Heinz; Modtler, Reiner; and Kratzsch, Eberhard, 4,447,489, Cl. 428-225.000.

Moe, Walter; and Diker, Charles M. Mobile blocks. 4,446,649, Cl. 46-218.000.

Moebus, Otto; Teuber, Michael; and Reuter, Helmut. Method of producing ethanol through fermentation of carbohydrates. 4,447,534, Cl. 435-161.000.

Moerkens, Jozef C.; and Verhees, Leonardus G. J., to U.S. Philips Corporation. Starter for igniting an electric discharge tube. 4,447,759, Cl. 315-60.000.

Mok, Christopher C. K.: *See—*
Lubbock, Frederick J.; Mok, Christopher C. K.; and Eldridge, Robert J., 4,447,475, Cl. 427-213.310.

Molas, Eugeni C. Clamp. 4,446,605, Cl. 24-277.000.

Molnar, Zoltan, to Licencia Talalmanyokat Ertekesito V. Universal screw press built in modular system. 4,446,788, Cl. 100-117.000.

Moloney, Donald J., to Knickerbocker Case Company. Printed circuit board container carrying case. 4,446,966, Cl. 206-334.000.

Monaco, Anthony P.: *See—*
DeFazio, Sally R.; Gozzo, James J.; and Monaco, Anthony P., 4,447,545, Cl. 436-518.000.

Monahan, Frederick A.: *See—*
Boyadjieff, George I; and Monahan, Frederick A., 4,446,761, Cl. 81-57.190.

Monsanto Company: *See—*
Adl, Mohammad S.; Kegeler, Gary H.; and Vandersall, Howard L., 4,447,337, Cl. 252-7.000.
Cohen, Saul M.; and LeBlanc, John R., 4,447,594, Cl. 528-245.000.
D'Amico, John J., 4,447,618, Cl. 548-170.000.
Vandersall, Howard L., 4,447,336, Cl. 252-7.000.

Monte, Alex A.; and Centofanti, Joan G., to Syva Company. Single test formulations for enzyme immunoassays and method for preparation. 4,447,527, Cl. 435-7.000.

Montgomery, Hugh S.: *See—*
Grantland, Gary; Montgomery, Hugh S.; Boeckmann, Eduard F. B.; and Woodworth, Larry A., 4,447,674, Cl. 179-81.00R.

Montiel, Alexandra. Applicator for liquids. 4,446,965, Cl. 206-205.000.

Mookherjee, Braja D.: *See—*
Spitz, Seymour J., Jr.; Mookherjee, Braja D.; Hill, Ira D.; Keleher, Lloyd F.; Trenkle, Robert W.; and Wolff, Robin K., 4,446,651, Cl. 47-10.000.

Moore, David O.: *See—*
Puvogel, Timothy J.; King, James D.; and Moore, David O., 4,446,780, Cl. 99-480.000.

Moore, Wayne A., to Tektronix, Inc. Emulator control sequencer. 4,447,876, Cl. 364-200.000.

Moran, Thomas F. Method of packaging elbow-shaped members and package made thereby. 4,446,964, Cl. 206-321.000.

Morelle, Jean V.; and Lauzanne-Morelle, Eliane M. T. Derivatives of lysine and aspartic acid. 4,447,366, Cl. 260-501.110.

Morgan Construction Company: *See—*
Klusmier, Kenneth L., 4,446,961, Cl. 198-443.000.

Morgan, Robert H., Jr. Device for supporting and rotating a hanging plant. 4,446,653, Cl. 47-67.000.

Mori, Katsuhiro: *See—*
Suzuki, Koichi; Yoshihara, Mikio; Kawai, Shinji; and Mori, Katsuhiro, 4,446,584, Cl. 4-237.000.

Mori, Kei. Apparatus for collecting and concentrating solar light energy. 4,447,718, Cl. 250-203.00R.

Moriguchi, Fujio: *See—*
Kurata, Masami; and Moriguchi, Fujio, 4,447,818, Cl. 346-76.0PH.

Kurata, Masami; Moriguchi, Fujio; Inui, Toshiharu; and Ohmori, Takashi, 4,447,832, Cl. 358-296.000.
Moriguchi, Haruhiko; and Ohmori, Takashi, to Fuji Xerox Co., Ltd. Thermal recording device. 4,447,819, Cl. 346-76.0PH.
Morimura, Tosio: *See*—
Shigeru, Kitahara; Okane, Isao; Shirai, Katsuyuki; and Morimura, Tosio, 4,447,501, Cl. 428-570.000.
Morioka, Akihiro; Maeda, Yuji; Matsumoto, Tetsuro; Yukinari, Masakazu; and Kishida, Eiichi, to Yokogawa Hokushin Electric Corporation. pH Sensor. 4,447,309, Cl. 204-402.000.
Morioka, Hiroaki: *See*—
Sakakibara, Naoji; Amano, Hiroyuki; and Morioka, Hiroaki, 4,446,889, Cl. 137-625.400.
Morita, Ken: *See*—
Ohyama, Hiroshi; Takada, Sanae; Morita, Ken; and Yamamura, Saburo, 4,447,259, Cl. 71-94.000.
Moriwaki, Takeshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Stem sealing apparatus having external tipping off burners. 4,447,216, Cl. 445-70.000.
Moriya, Yoshimi: *See*—
Suzuki, Shintaro; Iizuka, Sadao; and Moriya, Yoshimi, 4,447,264, Cl. 75-251.000.
Morris, Anthony F.: *See*—
Naf, Regula; Morris, Anthony F.; and Naf, Ferdinand, 4,447,627, Cl. 549-548.000.
Morris, George R. Vehicle full park engagement apparatus. 4,446,951, Cl. 192-4.00A.
Morris, Kenneth A.: *See*—
Ahn, Byung K.; and Morris, Kenneth A., 4,447,405, Cl. 423-88.000.
Morris Rod Weeder Co., Ltd.: *See*—
Machnee, Cecil; and Butuk, Fred N., 4,446,801, Cl. 111-86.000.
Morrison-Knudsen Company, Inc.: *See*—
Loire, Rene, 4,446,806, Cl. 114-219.000.
Moschopoulos, Anastasios, to Northern Telecom Limited. Base drive circuit for power transistors. 4,447,741, Cl. 307-31.000.
Moser, Mark M.: *See*—
Rainford, Robert E.; Moser, Mark M.; and Ojala, Jon R., 4,447,152, Cl. 356-237.000.
Moser, Werner: *See*—
Denk, Heimo; Mantsch, Peter; and Moser, Werner, 4,447,742, Cl. 307-106.000.
Moskowitz, Gerard J., to Dairyland Food Laboratories. Stabilization of enzyme compositions. 4,447,536, Cl. 435-188.000.
Moss Rosenberg Verft A/S: *See*—
Kristiansen, Olaf; and Brannstrom, Bo, 4,446,804, Cl. 114-74.00R.
Motorola Inc.: *See*—
Bjornholt, John E.; Foster, Richard G.; and Groth, Edward J., Jr., 4,447,907, Cl. 375-1.000.
DeLong, Ronald V., 4,447,772, Cl. 329-126.000.
Kent, Stephen L., 4,447,841, Cl. 361-18.000.
Rumbaugh, Robert C.; and Jarrett, Robert B., 4,446,843, Cl. 123-609.000.
Mowbray, Dorian F., to Lucas Industries Limited. Liquid fuel injection pumping apparatus. 4,446,835, Cl. 123-450.000.
Mowbray, Dorian F.; Fenne, Ivor; and Andrews, Richard J., to Lucas Industries Public Limited Company. Fuel injection pumping apparatus. 4,446,836, Cl. 123-450.000.
MPI, Inc.: *See*—
Spurlock, Robert C.; and Foster, Larry W., 4,447,382, Cl. 264-123.000.
MTU-Motoren-und-Turbinen-Union Friedrichschafen GmbH: *See*—
Leicht, Werner, 4,447,062, Cl. 277-3.000.
Mudge, Philip H.; and Kahl, William G., Jr., to Cerberus AG. Passive infrared intrusion detector. 4,447,726, Cl. 250-342.000.
Mueller, Dieter J.; Fricke, Hermann; and Spielbrink, Heinrich, to Chemische Werke Huels Aktiengesellschaft. Process for phosphating metallic surfaces in nonaqueous phosphating baths. 4,447,273, Cl. 148-6.15R.
Mueller, Jerry C., to Upjohn Manufacturing Company M, The. Treatment of adult respiratory distress syndrome. 4,447,451, Cl. 424-317.000.
Mukoyama, Yoshiyuki: *See*—
Nishizawa, Hiroshi; Mukoyama, Yoshiyuki; and Kasai, Shozo, 4,447,589, Cl. 528-45.000.
Mulder, James P.: *See*—
Novotny, Raymond J.; and Mulder, James P., 4,446,638, Cl. 37-142.00A.
Mulkey, Owen R., to Boeing Company, The. Optical information transfer system. 4,447,118, Cl. 350-96.160.
Muller, Erich: *See*—
Kersten, Peter; Meixner, Peter; Muller, Erich; and Horing, Eckart, 4,447,165, Cl. 384-428.000.
Muller, Hans, to Grapha-Holding AG. Apparatus for selectively transporting a stream of paper sheets or the like from a first path into one of several additional paths. 4,447,052, Cl. 271-280.000.
Muller, Norbert, to Hawera Probst GmbH & Co. Boring tool for radial enlargement of a cylindrical foundation bore. 4,446,934, Cl. 175-286.000.
Muller, Rolf; and Wille, Herbert, to Cassella Aktiengesellschaft. Process for the preparation of 4,5-dichloro-1,2-dithiacyclopenten-3-one. 4,447,623, Cl. 549-36.000.
Mullich, Richard O.; and Dushane, Ray, to TRE Corporation. Deadbolt. 4,446,707, Cl. 70-134.000.
Mulloy, Timothy P.: *See*—
Davis, Larry A.; Boyce, Gregory H.; Mulloy, Timothy P.; Nebeker, Neil J.; Newman, Elmer C.; Quinn, Donald J.; and Adamson, David L., 4,447,307, Cl. 204-267.000.
Mulzet, Alfred P., to International Business Machines Corporation. Continuous flow centrifuge assembly. 4,447,221, Cl. 494-45.000.
Mundt, Johann; Kasper, Horst; and Pritsch, Eckhard, to Uranit Uran-Isotopentrennungs-Gesellschaft mbH. Method for optimizing the power input of a plurality of hysteresis motors connected in parallel. 4,447,788, Cl. 318-799.000.
Murakami, Jyoji, to Fujitsu Limited. Semiconductor read only memory device. 4,447,893, Cl. 365-203.000.
Muramoto, Setsuo: *See*—
Hanaoka, Yuzuru; Murayama, Takeshi; and Muramoto, Setsuo, 4,447,559, Cl. 521-28.000.
Murasaki, Shun-ichi: *See*—
Inoue, Haruhiko; Murasaki, Shun-ichi; and Naito, Masataka, 4,447,352, Cl. 252-519.000.
Murata Kikai Kabushiki Kaisha: *See*—
Mima, Hiroshi, 4,446,687, Cl. 57-22.000.
Murayama, Takeshi: *See*—
Hanaoka, Yuzuru; Murayama, Takeshi; and Muramoto, Setsuo, 4,447,559, Cl. 521-28.000.
Murbach, Julius, to Murbach, Julius; and Stussi, Karl. Fixing plug. 4,447,182, Cl. 411-45.000.
Murchison, Craig B.; Stowe, Robert A.; and Weiss, Richard L., to Dow Chemical Company, The. Integrated Fischer-Tropsch and aromatic alkylation process. 4,447,664, Cl. 585-323.000.
Murman, Fernando: *See*—
Huey, Wai J.; Murman, Fernando; and Matsuda, Eugene, 4,447,037, Cl. 251-1.00B.
Murphy, Edwin L.: *See*—
Teranishi, Roy; Murphy, Edwin L.; Balser, Donald S.; and Howard, Walter E., 4,446,648, Cl. 43-131.000.
Murray, Richard C. Fire service harness. 4,446,943, Cl. 182-3.000.
Murtha, John C.: *See*—
Price, William L.; Murtha, John C.; Ross, James A., Jr.; Adam, Clyde E.; and Lucas, Kenneth R., 4,447,873, Cl. 364-200.000.
Murtha, Timothy P.; and Zuech, Ernest A., to Phillips Petroleum Company. Hydroalkylation catalyst and methods for producing and employing same. 4,447,554, Cl. 502-73.000.
Muth, David L.: *See*—
Faulkner, Richard D.; Henry, Dale V.; and Muth, David L., 4,447,758, Cl. 313-532.000.
Muto, Hiroyuki: *See*—
Hoshiyama, Satoshi; Muto, Hiroyuki; Shinke, Shuzo; Otsuka, Kanji; Takigawa, Shinichiro; and Yamazaki, Hiroyuki, 4,447,661, Cl. 568-882.000.
Myers, John W.: *See*—
Parrott, Stephen L.; and Myers, John W., 4,447,555, Cl. 502-74.000.
Nabisco Brands, Inc.: *See*—
Horwath, Robert O.; and Irbe, Robert M., 4,447,531, Cl. 435-94.000.
Nachfolger, Solomon J., to Diamond Shamrock Chemicals Company. Cementitious composition. 4,447,266, Cl. 106-90.000.
Naess. Method and apparatus for collecting oil and gas from an underwater blow-out. 4,447,247, Cl. 55-55.000.
Naf, Ferdinand: *See*—
Naf, Regula; Morris, Anthony F.; and Naf, Ferdinand, 4,447,627, Cl. 549-548.000.
Naf, Regula; Morris, Anthony F.; and Naf, Ferdinand, to Firmenich SA. Aliphatic epoxy-ketone. 4,447,627, Cl. 549-548.000.
Nagami, Yukio: *See*—
Mitamura, Gen; Eguchi, Takao; and Nagami, Yukio, 4,447,162, Cl. 368-295.000.
Nagano, Masashi, to Shimano Industrial Company Limited. Adjustable length crank arm for a bicycle. 4,446,753, Cl. 74-594.100.
Nagasaku, Eiichi; Kato, Kimihiro; and Yasunaga, Masao, to Nippondenso Co., Ltd. Rotary vane compressor with valve control of undervane pressure. 4,447,196, Cl. 418-93.000.
Nagata, Mituo: *See*—
Kamiyama, Fumio; Yamazaki, Kazutoshi; Kohara, Minoru; and Nagata, Mituo, 4,447,328, Cl. 210-635.000.
Nagel, Rudolf: *See*—
Boning, Bernward; Bone, Rainer; Nagel, Rudolf; Sellmaier, Franz; and Reum, Helmut, 4,446,723, Cl. 73-35.000.
Nagorski, Boguslaw A., to Fuji Photo Film Co., Ltd. Magnetic tape cartridge with resilient belt driving means and separate tape and belt idlers. 4,447,019, Cl. 242-192.000.
Naito, Masataka: *See*—
Inoue, Haruhiko; Murasaki, Shun-ichi; and Naito, Masataka, 4,447,352, Cl. 252-519.000.
Nakada, Seiichi; Ohno, Hiroshi; Nishijima, Tsuneo; and Kawakami, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Upright vacuum cleaner. 4,446,595, Cl. 15-365.000.
Nakagawa, Toyoaki; Nakajima, Masao; Kawamura, Yoshihisa; and Shioyama, Giichi, to Nissan Motor Co., Ltd. Exhaust gas recirculation control system for internal combustion engine. 4,446,840, Cl. 123-571.000.
Nakajima, Hideo: *See*—
Omae, Yoshihiro; Okubo, Noboru; Sigyo, Keiichi; Nakajima, Hideo; Fukui, Hiroaki; Yamada, Toshio; and Honda, Hideyuki, 4,447,805, Cl. 340-539.000.
Nakajima, Masao: *See*—
Nakagawa, Toyoaki; Nakajima, Masao; Kawamura, Yoshihisa; and Shioyama, Giichi, 4,446,840, Cl. 123-571.000.

Nakamura, Akiyoshi, to Minolta Camera Kabushiki Kaisha. Zoom lens system. 4,447,135, Cl. 350-426.000.
Nakamura, Katsuhiro, to Nippon Electric Co., Ltd. Device for encrypting each input data bit by at least one keying bit decided by a code pattern and a bit pattern of a predetermined number of preceding encrypted bits. 4,447,672, Cl. 178-22.190.
Nakamura, Tadashi: *See*—
Ohashi, Shigeo; Nakamura, Tadashi; and Kamisada, Koji, 4,447,685, Cl. 200-67.00D.
Nakamura, Yoshimi: *See*—
Sasaki, Yutaka; and Nakamura, Yoshimi, 4,447,558, Cl. 502-215.000.
Nakata, Minoru, to Kabushiki Kaisha Komatsu Seisakusho. Clutching and braking control for hydraulically driven crane winches. 4,447,044, Cl. 254-309.000.
Nakazawa, Toru; Fushida, Akira; and Kamezaki, Yasushi, to Mita Industrial Co., Ltd. Organic photosensitive material for electrophotography comprising polyvinylcarbazole and pyrene or phenanthrene. 4,447,514, Cl. 430-81.000.
Nalco Chemical Company: *See*—
Roe, William J., 4,447,344, Cl. 252-60.000.
Naramore, Raymond A., to Xerox Corporation. Constant velocity copy sheet transport with ink jet printing. 4,447,817, Cl. 346-75.000.
Naruto, Shunsuke: *See*—
Nishimura, Haruki; Naruto, Shunsuke; Mizuta, Hiroyuki; Kadokawa, Toshiaki; and Kawashima, Katsuyoshi, 4,447,439, Cl. 424-267.000.
National Carpet Jobbers, Inc.: *See*—
Bell, Dwain C.; Anderson, Lloyd E.; and Anderson, Martin L., 4,446,593, Cl. 15-322.000.
National Distillers and Chemical Corporation: *See*—
Blewett, Charles W., 4,447,659, Cl. 568-876.000.
Feldman, Julian, 4,447,643, Cl. 560-248.000.
National Laboratory for High Energy Physics: *See*—
Kusumegi, Asao; Kondo, Kenjiro; Watase, Yoshiyuki; Yoshimura, Yoshio; and Miyake, Kozo, 4,447,734, Cl. 250-517.100.
National Polymers, Inc.: *See*—
Anderson, Dennis C., 4,446,652, Cl. 47-66.000.
National Research Development Corporation: *See*—
Jones, Terence R.; Harrap, Kenneth R.; and Calvert, Alan H., 4,447,608, Cl. 544-287.000.
National Research Institute for Metals: *See*—
Shigeru, Kitahara; Okane, Isao; Shirai, Katsuyuki; and Morimura, Tosio, 4,447,501, Cl. 428-570.000.
National Semiconductor Corporation: *See*—
Dobkin, Robert C., 4,447,784, Cl. 323-226.000.
Nattel, William, to Commander Electrical Materials, Inc. Electrical wiring box arrangement. 4,447,030, Cl. 248-27.100.
Nebeker, Neil J.: *See*—
Davis, Larry A.; Boyce, Gregory H.; Mulloy, Timothy P.; Nebeker, Neil J.; Newman, Elmer C.; Quinn, Donald J.; and Adamson, David L., 4,447,307, Cl. 204-267.000.
Neefe, Charles W. Method of selectively tinting soft contact lenses. 4,447,474, Cl. 427-164.000.
Negi, Virendra S.: *See*—
Tague, Steven A.; and Negi, Virendra S., 4,447,870, Cl. 364-200.000.
Nelen, Petrus J. C.: *See*—
Geerdes, Dirk J. F.; and Nelen, Petrus J. C., 4,447,567, Cl. 523-501.000.
Neri, Bruce P.; and Liffmann, Stanley M., to Instrumentation Laboratory Inc. Method and reagent for determining inorganic phosphate in biological sample. 4,447,544, Cl. 436-105.000.
Neuhaus, Gunter: *See*—
Kotzur, Joachim; Reinersmann, Hans H.; Albers, Rolf; Aschenbruck, Emil; and Neuhaus, Gunter, 4,447,063, Cl. 277-80.000.
Neumann, Don B., to Excellon Industries. Scanning beam reference employing a retroreflective code means. 4,447,723, Cl. 250-236.000.
New England Deaconess Hospital: *See*—
DeFazio, Sally R.; Gozzo, James J.; and Monaco, Anthony P., 4,447,545, Cl. 436-518.000.
New Process Industries, Inc.: *See*—
Benson, Glendon M., 4,446,698, Cl. 60-520.000.
Newell, James M., to Di-Dro Systems Inc. Cylinder structure. 4,447,047, Cl. 267-118.000.
Newman, Elmer C.: *See*—
Davis, Larry A.; Boyce, Gregory H.; Mulloy, Timothy P.; Nebeker, Neil J.; Newman, Elmer C.; Quinn, Donald J.; and Adamson, David L., 4,447,307, Cl. 204-267.000.
Newton, Roger F.: *See*—
Collington, Eric W.; Finch, Harry; and Newton, Roger F., 4,447,428, Cl. 424-244.000.
Nguyen, Liem; Segal, William J.; and Friend, Kent, to Orion Industries, Inc. Convertible wire wheel hub cover. 4,447,091, Cl. 301-37.0AT.
NI Industries, Inc.: *See*—
Beisch, Hans R., 4,447,092, Cl. 301-37.00P.
Nicolay, Karl; and Hampel, Klaus, to Durkoppwerke GmbH. Upper fabric feed for a sewing machine. 4,446,803, Cl. 112-320.000.
Nielsen, Klaus W.: *See*—
Dunne, Maurice J.; and Nielsen, Klaus W., 4,447,697, Cl. 219-86.410.
Nielsen, Kurt F.: *See*—
Jensen, Niels D.; and Nielsen, Kurt F., 4,447,189, Cl. 415-168.000.
Niemoeller, Charles W. Wood kerf chuck. 4,447,050, Cl. 269-49.000.
Nierat, Jeanine: *See*—
Martel, Jacques; Buendia, Jean; and Nierat, Jeanine, 4,447,637, Cl. 560-124.000.
Nigon, Michel, to Automobiles Peugot; and Automobiles Citroen. Automotive blinker or turn indicator switch. 4,447,683, Cl. 200-61.270.
Nihon Kaiheiki Kogyo Kabushiki Kaisha: *See*—
Ohashi, Shigeo; Nakamura, Tadashi; and Kamisada, Koji, 4,447,685, Cl. 200-67.00D.
Nihon Plast Co., Ltd.: *See*—
Sugiyama, Tomokazu, 4,447,684, Cl. 200-61.540.
Nilsson, Hans Gosta; and Nilsson, Kurt A. G., to Atlas Copco Aktiebolag. Drill steel removal attachment for rock drilling machine. 4,446,930, Cl. 173-29.000.
Nilsson, Kurt A. G.: *See*—
Nilsson, Hans Gosta; and Nilsson, Kurt A. G., 4,446,930, Cl. 173-29.000.
Ninohira, Akira: *See*—
Uno, Akira; Noda, Touru; and Ninohira, Akira, 4,447,524, Cl. 430-538.000.
Nippon Columbia Kabushikikaisha: *See*—
Fukuda, Ryuichi; Fujiwara, Masami; and Ishiguro, Norio, 4,447,790, Cl. 330-149.000.
Nippon Electric Co., Ltd.: *See*—
Matsumoto, Michio; Kitamura, Masao; Ohta, Masataka; and Ohshima, Takeshi, 4,446,789, Cl. 101-93.040.
Nakamura, Katsuhiro, 4,447,672, Cl. 178-22.190.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Noro, Masao; and Kasahara, Yoshiki, 4,447,791, Cl. 330-297.000.
Nippon Kogaku K. K.: *See*—
Ogasawara, Akira, 4,447,719, Cl. 250-204.000.
Nippon Kogaku K.K.: *See*—
Nohda, Masao, 4,447,717, Cl. 250-201.000.
Terui, Nobuhiko, 4,447,768, Cl. 318-293.000.
Nippon Oil Co., Ltd.: *See*—
Fujiso, Tokuo; Ohmori, Tadashi; and Nomura, Soichi, 4,447,553, Cl. 502-36.000.
Nippon Piston Ring Co., Ltd.: *See*—
Hiraoka, Tokeshi; Urano, Shigeru; and Yamamoto, Kiyoshi, 4,447,275, Cl. 148-152.000.
Nippon Sanso K.K.: *See*—
Harada, Hikaru; Akiyama, Teruo; and Hiyama, Tuneo, 4,447,543, Cl. 436-72.000.
Nippon Soken, Inc.: *See*—
Sekiguchi, Kiyonori; Igashira, Toshihiko; Tanaka, Takeshi; Kawai, Hisasi; Yamada, Mitsumasa; Kawagoe, Michio; and Tanaka, Masaaki, 4,446,839, Cl. 123-569.000.
Nippon Telegraph & Telephone Public Corporation: *See*—
Kojima, Takafumi; Yoshida, Shigeru; and Mizoguchi, Masayuki, 4,447,679, Cl. 179-175.30R.
Matsumoto, Michio; Kitamura, Masao; Ohta, Masataka; and Ohshima, Takeshi, 4,446,789, Cl. 101-93.040.
Nippon Zeon Co., Ltd.: *See*—
Ogura, Shunichiro; and Miyamoto, Masafumi, 4,447,318, Cl. 208-348.000.
Nippondenso Co., Ltd.: *See*—
Inoue, Haruhiko; Murasaki, Shun-ichi; and Naito, Masataka, 4,447,352, Cl. 252-519.000.
Matsumura, Toshimi; Fujisawa, Hideya; Omori, Norio; Arimura, Takashi; Yamazoe, Hisamitsu; and Nishiura, Kiyotaka, 4,446,832, Cl. 123-339.000.
Nagasaku, Eiichi; Kato, Kimihiro; and Yasunaga, Masao, 4,447,196, Cl. 418-93.000.
Suzuki, Haruo; and Hashimoto, Shigeyoshi, 4,446,907, Cl. 164-120.000.
Nira, Hisami: *See*—
Kohmoto, Kohtaro; Ebara, Hiroyuki; and Nira, Hisami, 4,447,756, Cl. 313-487.000.
Nishida, Isamu: *See*—
Tsukada, Nobuo; and Nishida, Isamu, 4,447,163, Cl. 368-319.000.
Nishijima, Tsuneo: *See*—
Nakada, Seiichi; Ohno, Hiroshi; Nishijima, Tsuneo; and Kawakami, Hiroshi, 4,446,595, Cl. 15-365.000.
Nishikawa, Yoshinori; and Takahashi, Iwashige, to Kabushiki Kaisha Komatsu Seisakusho. Preparative monitoring apparatus for operation of a press. 4,446,787, Cl. 100-99.000.
Nishimoto, Shinichi: *See*—
Kataoka, Kenzo; Nishimoto, Shinichi; and Matoba, Kazunari, 4,447,207, Cl. 433-69.000.
Nishimura, Haruki; Naruto, Shunsuke; Mizuta, Hiroyuki; Kadokawa, Toshiaki; and Kawashima, Katsuyoshi, to Dainippon Pharmaceutical Co., Ltd. 2-Cyclic amino-2-(1,2-benzisoxazol-3-yl)acetic acid ester derivatives, process for the preparation thereof and composition containing the same. 4,447,439, Cl. 424-267.000.
Nishioka, Jim Z. Projectile shooting guide for bows. 4,446,844, Cl. 124-41.00A.
Nishiura, Kiyotaka: *See*—
Matsumura, Toshimi; Fujisawa, Hideya; Omori, Norio; Arimura, Takashi; Yamazoe, Hisamitsu; and Nishiura, Kiyotaka, 4,446,832, Cl. 123-339.000.
Nishizawa, Hiroshi; Mukoyama, Yoshiyuki; and Kasai, Shozo, to Hitachi Chemical Co., Ltd. Method for preparing polyamide-imide resin. 4,447,589, Cl. 528-45.000.
Nishizawa, Kazunori: *See*—
Ito, Osamu; and Nishizawa, Kazunori, 4,447,240, Cl. 604-385.000.
Nishizawa, Toshizo: *See*—
Yamazaki, Kisuke; Iijima, Hitoshi; Matsuoka, Fumio; and Nishizawa, Toshizo, 4,446,704, Cl. 62-180.000.

Nissan Chemical Industries Ltd.: *See*—
Hoshiyama, Satoshi; Muto, Hiroyuki; Shinke, Shuzo; Otsuka, Kanji; Takigawa, Shinichiro; and Yamazaki, Hiroyuki, 4,447,661, Cl. 568-882.000.
Suzuki, Fumio; Fujikawa, Yoshihiro; Yamamoto, Susumu; Mizutani, Hidemi; Ohya, Tunehiko; Ikai, Takashi; and Oguchi, Toshihiko, 4,447,256, Cl. 71-86.000.

Nissan Motor Co., Ltd.: *See*—
Kasai, Yoshiaki; and Ohgami, Masaaki, 4,447,880, Cl. 364-431.050.
Kasuya, Hideo; and Endo, Hiroshi, 4,447,800, Cl. 340-904.000.
Kubozuka, Takao, 4,446,827, Cl. 123-195.00R.
Nakagawa, Toyoaki; Nakajima, Masao; Kawamura, Yoshihisa; and Shioyama, Giichi, 4,446,840, Cl. 123-571.000.
Suzuki, Mikio; and Yamazaki, Masafumi, 4,446,838, Cl. 123-520.000.
Takahashi, Kotei, 4,446,755, Cl. 74-606.00R.
Yoneda, Kenji; Arai, Shoji; and Kunome, Yoshimi, 4,446,834, Cl. 123-440.000.

Nitto Chemical Industry Co., Ltd.: *See*—
Sasaki, Yutaka; and Nakamura, Yoshimi, 4,447,558, Cl. 502-215.000.

Niwa, Yoshiei, to Mitsubishi Denki Kabushiki Kaisha. Process and apparatus for high frequency discharge shaping of a workpiece by means of a rectangular bipolar pulsating voltage. 4,447,696, Cl. 219-69.00P.

Noda, Touru: *See*—
Uno, Akira; Noda, Touru; and Ninohira, Akira, 4,447,524, Cl. 430-538.000.

Noguchi, Hiroshi; Yoshida, Ryo; Sumida, Seizo; and Kamoshita, Katsuzo, to Sumitomo Chemical Company, Limited. N-Substituted phenyl-1-methylcyclopropanecarboxamides, and their herbicidal use. 4,447,260, Cl. 71-118.000.

Nohda, Masao, to Nippon Kogaku K.K. Automatic focusing device in a stereoscopic microscope. 4,447,717, Cl. 250-201.000.

Nolden, Werner, to American Standard, Inc. Wall mounted mixing valve. 4,446,885, Cl. 137-360.000.

Nomura, Kenji: *See*—
Ochiai, Yoshiki; Nomura, Kenji; Yamakage, Tetsuro; and Takashima, Toshiharu, 4,447,177, Cl. 408-161.000.

Nomura, Soichi: *See*—
Fujiso, Tokuo; Ohmori, Tadashi; and Nomura, Soichi, 4,447,553, Cl. 502-36.000.

Noon, Robert A.: *See*—
Kay, Ian T.; Bartholomew, David; Williams, Emyr G.; and Noon, Robert A., 4,447,446, Cl. 424-282.000.

Nordson Corporation: *See*—
Baker, Robert G., 4,447,707, Cl. 219-301.000.
Matt, Timothy S., 4,447,465, Cl. 427-10.000.

Norigoe, Takashi: *See*—
Ochiai, Kuniaki; Horii, Masami; and Norigoe, Takashi, 4,447,166, Cl. 400-124.000.

Noro, Masao; and Kasahara, Yoshiki, to Nippon Gakki Seizo Kabushiki Kaisha. Power supply changeover type power amplifier. 4,447,791, Cl. 330-297.000.

North American Philips Corporation: *See*—
Dunlap, Clifford E., 4,446,959, Cl. 198-382.000.

North Dakota State University: *See*—
Boudjouk, Philip R., 4,447,633, Cl. 556-479.000.

Northern Lights Trust: *See*—
Csongor, Desider G., 4,447,156, Cl. 366-80.000.

Northern Telecom Limited: *See*—
Moschopoulos, Anastasios, 4,447,741, Cl. 307-31.000.
Unterhoffer, Peter P.; and Dufresne, Gilles L., 4,446,655, Cl. 49-368.000.

Northrop Corporation: *See*—
Yunt, Fred W., 4,447,183, Cl. 411-57.000.

Notestein, John E.: *See*—
Shang, Jer-Yu; Notestein, John E.; Mei, Joseph S.; and Zeng, Li-Wen, 4,447,297, Cl. 202-99.000.

Nothaft, Eugene M., to Minnesota Mining and Manufacturing Company. Alarm data concentration and gathering system. 4,447,872, Cl. 364-200.000.

Novack, Robert L.: *See*—
Anouchi, Abraham Y.; Novack, Robert L.; and Tomasovic, Beth, 4,447,397, Cl. 422-94.000.

Novotny, Raymond J.; and Mulder, James P., to Abex Corporation. Dipper tip retaining pin. 4,446,638, Cl. 37-142.00A.

Nowell, Gilbert S.: *See*—
Slosberg, David K.; and Nowell, Gilbert S., 4,447,484, Cl. 428-137.000.

Nowell, Larry H.; and Halley, Robert, to United States of America, Navy. Single handed set-up apparatus. 4,446,624, Cl. 33-1.00C.

Nozaki, Shigeki: *See*—
Takemae, Yoshihiro; Enomoto, Seiji; Nozaki, Shigeki; Mezawa, Tsutomu; and Kabashima, Katsuhiko, 4,447,745, Cl. 307-269.000.

Nozaki, Toshikatsu: *See*—
Matsushita, Yukio; and Nozaki, Toshikatsu, 4,446,833, Cl. 123-435.000.

NRM Corporation: *See*—
Blosser, Virgil Y.; Isaksson, G. E.; Rupp, Dallas B.; and Singh, A. P., 4,447,385, Cl. 264-315.000.

Nugyen, On V.: *See*—
Jayadev, Tumkur S.; and Nugyen, On V., 4,447,277, Cl. 148-400.000.

Nyffeler, Corti AG: *See*—
Buri, Hermann; and Karth, Beat, 4,447,184, Cl. 413-26.000.

O & S Manufacturing Company: *See*—
Trudeau, William H.; Gaines, Donald R.; and Smallegan, Jon M., 4,447,094, Cl. 308-2.00R.

Oak Industries Inc.: *See*—
den Toonder, Pieter, 4,447,828, Cl. 358-118.000.

Oana, Yasuhisa; Yasuda, Nobuaki; Yamashita, Masato; and Ozawa, Norio, to Tokyo Shibaura Denki Kabushiki Kaisha. III–V Group compound semiconductor light-emitting element having a doped tantalum barrier layer. 4,447,825, Cl. 357-71.000.

Oberhauser, Peter: *See*—
Sarin, Vinod K.; and Oberhauser, Peter, 4,446,936, Cl. 175-410.000.

Oberwelland, Klaus: *See*—
Adolf, Lutz-Erdmut; and Oberwelland, Klaus, 4,447,202, Cl. 425-434.000.

Occidental Chemical Corporation: *See*—
Dannels, W. Andrew; and Bainbridge, Robert W., 4,447,386, Cl. 264-328.200.
McKaveney, James P., 4,447,492, Cl. 428-328.000.
Scharf, Daniel J.; Ilardo, Charles S.; Schwartz, Willis T.; and Salee, Gideon, 4,447,572, Cl. 524-371.000.

Ochiai, Kuniaki; Horii, Masami; and Norigoe, Takashi, to Tokyo Electric Co., Ltd. Printing head of dot printer. 4,447,166, Cl. 400-124.000.

Ochiai, Osamu, to Seiko Instruments & Electronics Ltd. Miniature GT-cut quartz resonator. 4,447,753, Cl. 310-312.000.

Ochiai, Yoshiki; Nomura, Kenji; Yamakage, Tetsuro; and Takashima, Toshiharu, to Toyoda Koki Kabushiki Kaisha. Tool holder with tool position compensating mechanism. 4,447,177, Cl. 408-161.000.

Oda, Keijiro: *See*—
Kishida, Katsuji; Oonishi, Masakazu; and Oda, Keijiro, 4,446,904, Cl. 152-356.00R.

O'Donnell, Derek: *See*—
Howard, Peter B.; and O'Donnell, Derek, 4,447,270, Cl. 106-300.000.
Howard, Peter B.; and O'Donnell, Derek, 4,447,271, Cl. 106-300.000.

Odstrchel, Gerald: *See*—
Ellis, James E.; Lidgard, Graham P.; Odstrchel, Gerald; and Riceberg, Louis J., 4,447,528, Cl. 435-7.000.

Oechsner, Hans, to Leybold Heraeus GmbH. Apparatus for the chemical analysis of samples. 4,447,724, Cl. 250-309.000.

Oediger, Hermann; Lieb, Folker; and Disselnkotter, Hans, to Bayer Aktiengesellschaft. Phosphonoformaldehyde, a process for its preparation and its use as an intermediate product for the preparation of medicaments. 4,447,367, Cl. 260-502.40R.

O'Farrell, Charles P.: *See*—
Lundberg, Robert D.; Walker, Thad O.; O'Farrell, Charles P.; and Makowski, Henry S., deceased, 4,447,338, Cl. 252-8.50M.

Ogasawara, Akira, to Nippon Kogaku K. K. Automatic focus adjusting apparatus using weighted average means. 4,447,719, Cl. 250-204.000.

Ogawa, Kazufumi; Chikamura, Takao; and Shibata, Takuo, to Matsuchita Electric Industrial Co., Ltd. Solid-state image pickup element and process for fabricating the same. 4,447,720, Cl. 250-211.00J.

Ogawa, Tomoya: *See*—
Matsui, Masanao; and Ogawa, Tomoya, 4,447,605, Cl. 544-225.000.

Ogi, Katsumi: *See*—
Kimura, Etsuji; Ogi, Katsumi; Sato, Kazusuke; and Hashimoto, Mayuki, 4,447,045, Cl. 266-149.000.

Ogiso, Makoto: *See*—
Hidaka, Tsuneo; Inoue, Masahide; and Ogiso, Makoto, 4,447,210, Cl. 433-173.000.

Oguchi, Toshihiko; Kato, Hirohisa; and Yokoyama, Hirotaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and apparatus for perpendicular magnetic recording medium. 4,447,467, Cl. 427-48.000.

Oguchi, Toshihiko: *See*—
Suzuki, Fumio; Fujikawa, Yoshihiro; Yamamoto, Susumu; Mizutani, Hidemi; Ohya, Tunehiko; Ikai, Takashi; and Oguchi, Toshihiko, 4,447,256, Cl. 71-86.000.

Ogura, Haruo; Furuhata, Kimio; Osawa, Toshiaki; Toyoshima, Satoshi; Shitori, Yoshiyasu; and Ito, Masayoshi, to Kanto Ishi Pharmaceutical Co., Ltd. N-Acetylneuraminic acid derivatives and the preparation thereof. 4,447,600, Cl. 536-23.000.

Ogura, Masahiro: *See*—
Watanabe, Kiyoshi; Ideguchi, Satoshi; Ogura, Masahiro; Shimada, Masahiko; and Kawaharada, Hajime, 4,447,362, Cl. 260-396.00R.

Ogura, Shunichiro; and Miyamoto, Masafumi, to Nippon Zeon Co., Ltd. Extractive distillation method. 4,447,318, Cl. 208-348.000.

O'Hara, Mark J.; and Johnson, Russell W., to UOP Inc. Hydrocarbon conversion catalyst and use thereof. 4,447,556, Cl. 502-74.000.

Ohashi, Shigeo; Nakamura, Tadashi; and Kamisada, Koji, to Nihon Kaiheiki Kogyo Kabushiki Kaisha. Small-sized push-button switch. 4,447,685, Cl. 200-67.00D.

Ohgami, Masaaki: *See*—
Kasai, Yoshiaki; and Ohgami, Masaaki, 4,447,880, Cl. 364-431.050.

Ohmori, Tadashi: *See*—
Fujiso, Tokuo; Ohmori, Tadashi; and Nomura, Soichi, 4,447,553, Cl. 502-36.000.

Ohmori, Takashi: *See*—
Kurata, Masami; Moriguchi, Fujio; Inui, Toshiharu; and Ohmori, Takashi, 4,447,832, Cl. 358-296.000.
Moriguchi, Haruhiko; and Ohmori, Takashi, 4,447,819, Cl. 346-76.0PH.

Ohnishi, Haruo; Itoh, Chihiro; and Mochida, Ei, to Mochida Pharmaceutical Co., Ltd. Pharmaceutical composition and method for treatment of peptic ulcer. 4,447,437, Cl. 424-263.000.

Ohno, Hiroshi: *See*—
Nakada, Seiichi; Ohno, Hiroshi; Nishijima, Tsuneo; and Kawakami, Hiroshi, 4,446,595, Cl. 15-365.000.
Ohrnberger, Gerd: *See*—
Bauder, Armin; and Ohrnberger, Gerd, 4,446,828, Cl. 123-196.00R.
Ohshima, Takeshi: *See*—
Matsumoto, Michio; Kitamura, Masao; Ohta, Masataka; and Ohshima, Takeshi, 4,446,789, Cl. 101-93.040.
Ohta, Masataka: *See*—
Matsumoto, Michio; Kitamura, Masao; Ohta, Masataka; and Ohshima, Takeshi, 4,446,789, Cl. 101-93.040.
Ohtsu, Takaji: *See*—
Soneda, Mitsuo; and Ohtsu, Takaji, 4,447,812, Cl. 340-784.000.
Ohya, Tunehiko: *See*—
Suzuki, Fumio; Fujikawa, Yoshihiro; Yamamoto, Susumu; Mizutani, Hidemi; Ohya, Tunehiko; Ikai, Takashi; and Oguchi, Toshihiko, 4,447,256, Cl. 71-86.000.
Ohyama, Hiroshi; Takada, Sanae; Morita, Ken; and Yamamura, Saburo, to Hokko Chemical Industry Co., Ltd. 2-(Substituted phenoxy)propionic acid derivatives and their uses for herbicidal purposes. 4,447,259, Cl. 71-94.000.
Oikawa, Yasunobu: *See*—
Masujima, Sho; Shibuya, Masahide; Shoichi, Iwaya; Umeda, Kenichi; Oikawa, Yasunobu; Abe, Hisao; Midori, Yoshifumi; Fujiwara, Shinobu; and Kikuchi, Nobuaki, 4,447,549, Cl. 501-138.000.
Ojala, Jon R.: *See*—
Rainford, Robert E.; Moser, Mark M.; and Ojala, Jon R., 4,447,152, Cl. 356-237.000.
Okada, Kunihiro: *See*—
Kodama, Kazuyuki; Endo, Takeyuki; Okada, Kunihiro; and Shibuya, Yasutaka, 4,447,809, Cl. 340-747.000.
Okamoto, Takanori: *See*—
Kanaoka, Kunio; Okamoto, Takanori; and Matsuda, Hideaki, 4,447,563, Cl. 523-176.000.
Okane, Isao: *See*—
Shigeru, Kitahara; Okane, Isao; Shirai, Katsuyuki; and Morimura, Tosio, 4,447,501, Cl. 428-570.000.
Okubo, Noboru: *See*—
Omae, Yoshihiro; Okubo, Noboru; Sigyo, Keiichi; Nakajima, Hideo; Fukui, Hiroaki; Yamada, Toshio; and Honda, Hideyuki, 4,447,805, Cl. 340-539.000.
Okubo, Shigeo, to Design Professionals Financial Corporation. Stress control in solid materials. 4,446,733, Cl. 73-579.000.
Okura Kogyo Kabushiki Kaisha: *See*—
Kanaoka, Kunio; Okamoto, Takanori; and Matsuda, Hideaki, 4,447,563, Cl. 523-176.000.
Okuyama, Katsuo: *See*—
Takahashi, Yoshihiro; Okuyama, Katsuo; and Matsukuma, Yutaka, 4,447,856, Cl. 361-383.000.
O'Laughlin, Richard L.: *See*—
Wang, Yu-Chang J.; Dursch, Friedrich; O'Laughlin, Richard L.; and Prusik, Thaddeus, 4,447,426, Cl. 424-243.000.
Olin Corporation: *See*—
Ungarean, Gary L.; and Yarwood, John C., 4,446,908, Cl. 164-452.000.
Whitman, Hobart A., III, 4,447,709, Cl. 219-384.000.
Yarwood, John C.; Ungarean, Gary L.; Kindlmann, Peter J.; and Tyler, Derek E., 4,446,909, Cl. 164-453.000.
Oliver, Robert; and Branscombe, Richard, to E & J Gallo Winery. Bottle cork extractor. 4,446,980, Cl. 215-276.000.
Olivera, Baldomero M.; Cruz, Lourdes J.; Gray, William R.; and Rivier, Jean E. F. Conotoxins. 4,447,356, Cl. 260-112.50R.
Olsen, Roger F., to Incom International Inc. Multiple-type cable mounting apparatus and method. 4,447,032, Cl. 248-558.000.
Olsson, Knut G.: *See*—
Bjork, Anders K. K.; Olsson, Knut G.; Abramo, Aina L.; and Christensson, Erik G., 4,447,433, Cl. 424-250.000.
Olympus Optical Co., Ltd.: *See*—
Kano, Tokio, 4,447,396, Cl. 422-73.000.
Kato, Toshikazu, 4,447,838, Cl. 360-96.500.
Tanikawa, Kowji, 4,447,160, Cl. 368-34.000.
Omae, Yoshihiro; Okubo, Noboru; Sigyo, Keiichi; Nakajima, Hideo; Fukui, Hiroaki; Yamada, Toshio; and Honda, Hideyuki, to Mitsubishi Kasei Kogyo Kabushiki Kaisha. Apparatus for measuring temperature of coke ovens. 4,447,805, Cl. 340-539.000.
Omori, Norio: *See*—
Matsumura, Toshimi; Fujisawa, Hideya; Omori, Norio; Arimura, Takashi; Yamazoe, Hisamitsu; and Nishiura, Kiyotaka, 4,446,832, Cl. 123-339.000.
Oonishi, Masakazu: *See*—
Kishida, Katsuji; Oonishi, Masakazu; and Oda, Keijiro, 4,446,904, Cl. 152-356.00R.
O'Pray, Bruce L., to Control Resources Corporation. Programmable bus for the control of electronic apparatus. 4,447,813, Cl. 340-825.100.
Oreco III, Inc.: *See*—
Evans, Orde R., 4,447,076, Cl. 285-55.000.
Orion Industries, Inc.: *See*—
Nguyen, Liem; Segal, William J.; and Friend, Kent, 4,447,091, Cl. 301-37.0AT.
Orthner, Carolyn L.: *See*—
Menache-Aronson, Doris; Kosow, David P.; Orthner, Carolyn L.; and Behre, H. Evan, 4,447,416, Cl. 424-101.000.
Osaka Taiyo Co., Ltd.: *See*—
Fujita, Hiromu, 4,447,041, Cl. 254-9.00R.
Osawa, Toshiaki: *See*—
Ogura, Haruo; Furuhata, Kimio; Osawa, Toshiaki; Toyoshima, Satoshi; Shitori, Yoshiyasu; and Ito, Masayoshi, 4,447,600, Cl. 536-23.000.
Osborn, Thomas W., III, to Procter & Gamble Company, The. Process for making absorbent tissue paper with high wet strength and low dry strength. 4,447,294, Cl. 162-158.000.
Oshima, Yutaka. Ivorylike material for keys of musical instruments and method for producing same. 4,447,268, Cl. 106-148.000.
Osthaus, Georg: *See*—
Zucker, Friedrich J.; and Osthaus, Georg, 4,447,535, Cl. 435-162.000.
Otani, Toshihisa: *See*—
Ushio, Tetsuji; Tatsuguchi, Satoru; Otani, Toshihisa; Tani, Hoshiro; and Yabe, Tetsuo, 4,447,306, Cl. 204-224.00R.
Otisca Industries, Ltd.: *See*—
Smith, Clay D.; and Keller, Douglas V., Jr., 4,447,245, Cl. 44-1.0SR.
Otsuka, Kanji: *See*—
Hoshiyama, Satoshi; Muto, Hiroyuki; Shinke, Shuzo; Otsuka, Kanji; Takigawa, Shinichiro; and Yamazaki, Hiroyuki, 4,447,661, Cl. 568-882.000.
Ott, David A., to Milliken Research Corporation. Carpet display rack. 4,446,974, Cl. 211-45.000.
Otte, Heinz: *See*—
Otte, Wolf-Dieter; Otte, Heinz; Schider, Siegfried; and Wiesner, Otto, 4,446,857, Cl. 128-92.0BC.
Otte, Wolf-Dieter; Otte, Heinz; Schider, Siegfried; and Wiesner, Otto, to Schwarzkopf Development Corporation. Medullary nail and process for the production thereof. 4,446,857, Cl. 128-92.0BC.
Oude Alink, Bernardus A., to Petrolite Corporation. Hydroxy and hydroperoxy tetrahydropyrimidines. 4,447,606, Cl. 544-231.000.
Oudelaar, Tone, to Applieu Power Inc. Tiltcab truck with hydraulic lost motion. 4,446,939, Cl. 180-89.150.
Outboard Marine Corporation: *See*—
Henrich, Donald A., 4,447,214, Cl. 440-66.000.
Overy, Colin: *See*—
Dynie, Ernest R.; and Overy, Colin, 4,446,681, Cl. 56-16.700.
Owens-Corning Fiberglas Corporation: *See*—
Bhatti, Mohinder S., 4,447,248, Cl. 65-2.000.
Grubka, Lawrence J., 4,447,250, Cl. 65-11.100.
Kopena, David M., 4,447,249, Cl. 65-4.400.
Shannon, Richard F.; and Helser, Jerry L., 4,447,380, Cl. 264-82.000.
Owens-Illinois, Inc.: *See*—
Zauner, Otto; and Bender, Fred, 4,446,960, Cl. 198-408.000.
Owsely, Herbert B.: *See*—
Bunn, Stuart E.; and Owsely, Herbert B., 4,447,193, Cl. 417-441.000.
Oxenrider, Bryce C.; and Long, David J., to Allied Corporation. Fluorinated and non-fluorinated siloxy pyromellitates. 4,447,629, Cl. 556-419.000.
Ozaki, Yoshio: *See*—
Tsurumoto, Kazuo; and Ozaki, Yoshio, 4,447,713, Cl. 219-69.00G.
Ozawa, Chiaki: *See*—
Azuma, Yusaku; Kitayama, Yoshifumi; and Ozawa, Chiaki, 4,447,014, Cl. 242-55.000.
Ozawa, Norio: *See*—
Oana, Yasuhisa; Yasuda, Nobuaki; Yamashita, Masato; and Ozawa, Norio, 4,447,825, Cl. 357-71.000.
Ozen Corporation: *See*—
Koike, Eishi, 4,447,898, Cl. 369-65.000.
Page, Edward A.; and Babel, Carl R., to Ensco Inc. Fiber optic security system including a fiber optic seal and an electronic verifier. 4,447,123, Cl. 350-96.240.
Paglotke, Karlheinz: *See*—
Bukowiecki, Stanislaw; and Paglotke, Karlheinz, 4,446,718, Cl. 73-23.000.
Palmer, John H., to Ramer Test Tools, Inc. Fitting for smooth wall tubes. 4,447,077, Cl. 285-104.000.
Panuska, Andrew J.; Santana, Manuel R.; and Sprow, Robert B., to AT&T Technologies, Inc.; and AT&T Bell Laboratories. Methods of and apparatus for controlling core-to-sheath length ratio in lightguide fiber cable and cable produced by the methods. 4,446,686, Cl. 57-6.000.
Paquette, Elmer G.: *See*—
Dunn, Stanley A.; Pomplun, Alan R.; Paquette, Elmer G.; Ethridge, Edwin C.; and Johnson, Jerry. L., 4,447,251, Cl. 65-142.000.
Parker, Dane K., to Goodyear Tire & Rubber Company, The. Polymer bound aryl substituted crown ethers. 4,447,585, Cl. 525-359.200.
Parker, Dane K.; and Sabo, Timothy A., to Goodyear Tire & Rubber Company, The. Process for the dehalogenation of organic compounds. 4,447,667, Cl. 585-469.000.
Parker-Hannifin Corporation: *See*—
Mayfield, William B., 4,447,233, Cl. 604-152.000.
Mayfield, William B., 4,447,234, Cl. 604-151.000.
Parker, Ray, to Thatchcode Limited T/A Flexiform. Preventing toppling of cabinets or other furniture. 4,447,098, Cl. 312-216.000.
Parker, Theodore L.: *See*—
Caskey, Terrence L.; Parker, Theodore L.; and Martin, Patrick H., 4,447,598, Cl. 528-489.000.
Parks, Leon C.: *See*—
Frisch, Eldon E.; and Parks, Leon C., 4,447,237, Cl. 604-175.000.
Parrott, Stephen L.; and Myers, John W., to Phillips Petroleum Company. Hydrocracking catalysts. 4,447,555, Cl. 502-74.000.

Pask, George: *See*—
Pidcock, Anthony; and Pask, George, 4,446,693, Cl. 60-39.320.
Patel, Bhupendra C., to Kendall Company, The. Catheter. 4,447,228, Cl. 604-103.000.
Patel, Parsotam T.: *See*—
Bergeron, David L.; and Patel, Parsotam T., 4,446,611, Cl. 29-578.000.
Paul, Herman L., Jr., to Continental Disc Corporation. End loaded valve. 4,446,883, Cl. 137-315.000.
Paul, Rolf, to American Cyanamid Company. Substituted-6-n-propyl-8-methylimidazo[1,5-d]-as-triazin-4-(3H)-ones. 4,447,603, Cl. 544-184.000.
Pauley, General J., to Gala Industries, Inc. Vertical pre-dewatering screen. 4,447,325, Cl. 210-295.000.
Pauli, George B.: *See*—
Smith, Donald C.; Snow, Richard F.; and Pauli, George B., 4,447,864, Cl. 362-311.000.
Pavlik, Norman M.: *See*—
Sefko, John; and Pavlik, Norman M., 4,447,795, Cl. 336-178.000.
Payet, George L.: *See*—
Hendrix, James E.; and Payet, George L., 4,447,241, Cl. 8-116.400.
Payne, Roger A.: *See*—
Gray, Herbert W.; and Payne, Roger A., 4,447,378, Cl. 264-45.900.
PCUK Produits Chimiques Ugine Kuhlmann: *See*—
Jouannetaud, Marie-Paule; Gesson, Jean-Pierre; and Jacquesy, Jean-Claude, 4,447,660, Cl. 568-774.000.
Pearson, Arthur D.: *See*—
Lazay, Paul D.; Lemaire, Paul J.; and Pearson, Arthur D., 4,447,125, Cl. 350-96.300.
Pedersen, Vernon G., to Dacor Corporation. Breathing apparatus. 4,446,859, Cl. 128-204.260.
Peeters, Hermann, to Dynamit Nobel AG. Method of preparing 2-alkoxy-4-aminopyrimidines. 4,447,609, Cl. 544-317.000.
Pence, Dallas T.; and Chou, Chun-Chao, to United States of America, Energy. Method for treating a nuclear process off-gas stream. 4,447,353, Cl. 252-630.000.
Perfecto, Inc.: *See*—
Enberg, Erik R.; and Plank, J. Douglas, 4,447,016, Cl. 242-56.900.
Perkam Limited: *See*—
Biss, Edgar L., 4,447,885, Cl. 364-568.000.
Perkin-Elmer Corp., The: *See*—
Quick, Donald L., 4,447,783, Cl. 323-275.000.
Perkins, Ezra C.; and Connolly, Ronald G. Joint treatment. 4,446,578, Cl. 3-1.910.
Perl, Ludovic; and Szabo, Bill, to Herder, N.V. Cabinet assembly system. 4,447,096, Cl. 312-111.000.
Persson, Bengt. Arrangement in angle rulers for improving fixture of an angularly adjustable blade of said rulers to the stock thereof in selected blade positions relative thereto. 4,446,627, Cl. 33-497.000.
Persson, John A., to Lectromelt Corporation. Arc furnace for producing aluminum. 4,447,906, Cl. 373-72.000.
Pesch, Karl, to Rohm GmbH. Chuck with safety cutout. 4,447,180, Cl. 409-232.000.
Peters, John W., to Hughes Aircraft Company. Process for forming sulfide layers by photochemical vapor deposition. 4,447,469, Cl. 427-54.100.
Peterson, John F.; and Bartlett, Allen J., to Helix Technology Corporation. Multiport cryopump. 4,446,702, Cl. 62-55.500.
Peterson, Kenneth E. Toilet tissue dispensing device. 4,447,015, Cl. 242-55.200.
Peterson, Robert L., to Galson Research Corporation. Methods for decontaminating soil. 4,447,541, Cl. 435-264.000.
Peterson, Wesley R., to Singer Company, The. Fabric repairing tool with cylindrical sheet metal cutter. 4,446,621, Cl. 30-241.000.
Petro-Drive, Inc.: *See*—
Hipp, James, 4,446,932, Cl. 175-74.000.
Petrolite Corporation: *See*—
Oude Alink, Bernardus A., 4,447,606, Cl. 544-231.000.
Petty, David C.: *See*—
Harris, William J.; Jackson, Joseph M.; and Petty, David C., 4,447,676, Cl. 179-90.0BD.
Petty-Weeks, Bruce: *See*—
Donohue, John A.; Knobloch, James O.; Petty-Weeks, Bruce; and Cerefice, Steven A., 4,447,645, Cl. 562-473.000.
Phelps, Douglas W., Jr.: *See*—
Marks, Robert; Phelps, Douglas W., Jr.; and Ward, William C., 4,447,857, Cl. 361-395.000.
Philibert, Daniel: *See*—
Teutsch, Jean G.; Costerousse, Germain; Philibert, Daniel; and Deraedt, Roger, 4,447,424, Cl. 424-238.000.
Phillips Petroleum Company: *See*—
Casperson, John R.; and Hamn, Paul D., 4,447,401, Cl. 422-151.000.
Hitzman, Donald O., 4,446,919, Cl. 166-246.000.
Mathis, Ronald D.; and Reed, Jerry A., 4,447,597, Cl. 528-388.000.
Murtha, Timothy P.; and Zuech, Ernest A., 4,447,554, Cl. 502-73.000.
Parrott, Stephen L.; and Myers, John W., 4,447,555, Cl. 502-74.000.
Smith, Clifford E.; Mark, Harold W.; Louthan, Rector P.; and Efner, Howard F., 4,447,246, Cl. 144-57.000.
Pidcock, Anthony; and Pask, George, to Rolls-Royce Limited. Wall structure for a combustion chamber. 4,446,693, Cl. 60-39.320.
Piersol, Jay L., to Armstrong World Industries, Inc. Low density fibrous sheet material. 4,447,560, Cl. 521-68.000.
Pillis, Lewis J.; and Davis, Lois T., to Sybron Corporation. Microorganism capable of degrading phenolics. 4,447,539, Cl. 435-253.000.
Pillow, Dan L., to Dresser Industries, Inc. Fluid operated rock drill hammer. 4,446,929, Cl. 173-17.000.
Pilot Man-Nen-Hitsu Kabushiki Kaisha: *See*—
Tokorozawa, Sadao, 4,446,993, Cl. 222-214.000.
Pinschmidt, Robert K., Jr.: *See*—
Cook, Gerald R.; Iacoviello, John G.; Pinschmidt, Robert K., Jr.; and Davidowich, George, 4,447,570, Cl. 524-127.000.
Pitney Bowes Inc.: *See*—
Duwell, Edward C.; and Jones, Howell A., Jr., 4,447,890, Cl. 364-900.000.
Hatzis, Van, 4,447,148, Cl. 355-75.000.
Plank, J. Douglas: *See*—
Enberg, Erik R.; and Plank, J. Douglas, 4,447,016, Cl. 242-56.900.
Plastona (John Waddington) Ltd.: *See*—
Harrison, Peter; and Gaunt, Thomas N., 4,447,479, Cl. 428-35.000.
Platmanufaktur AB: *See*—
Sallnert, Kjell; Fridh, Carl-Erik; and Hansson, Manfred, 4,446,710, Cl. 72-10.000.
Polen, Karl L.: *See*—
Kinkopf, Edward J.; and Polen, Karl L., 4,446,813, Cl. 118-72.000.
Pollington, Warren J.: *See*—
Davis, Arthur M.; and Pollington, Warren J., 4,447,188, Cl. 415-115.000.
Polychrome Corporation: *See*—
Rowe, William; Golda, Eugene; and Wilkes, Alan, 4,447,512, Cl. 430-17.000.
Pomplun, Alan R.: *See*—
Dunn, Stanley A.; Pomplun, Alan R.; Paquette, Elmer G.; Ethridge, Edwin C.; and Johnson, Jerry. L., 4,447,251, Cl. 65-142.000.
Porenski, Harry S., Jr., to Brown & Williamson Tobacco Corporation. Cigarette filter. 4,446,878, Cl. 131-336.000.
Positioning Devices, Inc.: *See*—
Souder, James J., Jr.; Scarborough, Edward D., Jr.; Fox, Merlin D.; Rettich, Donald R.; and Mason, Robert L., 4,447,031, Cl. 248-280.100.
Post Office, The: *See*—
Davies, Graham J.; Heckingbottom, Roger; and Andrews, David A., 4,447,276, Cl. 148-175.000.
PPG Industries, Inc.: *See*—
Franz, Helmut; Duffer, Paul F.; and Kelly, Joseph D., 4,447,496, Cl. 428-432.000.
Precision Machine Products, Inc.: *See*—
Clingman, William H.; and Hall, Kenneth R., 4,446,748, Cl. 73-863.030.
Precitronic Gesellschaft fur Feinmechanik und Electronic mbH: *See*—
Kern, Bernd M.; and Hasse, Werner, 4,447,211, Cl. 434-12.000.
Prescher, Gunter: *See*—
Beschke, Helmut; Dahm, Franz-Ludwig; Friedrich, Heinz; and Prescher, Gunter, 4,447,614, Cl. 546-316.000.
Beschke, Helmut; Dahm, Franz-Ludwig; Friedrich, Heinz; and Prescher, Gunter, 4,447,615, Cl. 546-317.000.
Pretzer, Wayne R.; Kobylinski, Thaddeus P.; and Bozik, John E., to Gulf Research & Development Company. Process for selective formation of C4 compounds and thiol-containing catalyst system used therein. 4,447,557, Cl. 502-161.000.
Prew, Stanley, to Koppers Company, Inc. Plate adjustment system. 4,447,011, Cl. 241-37.000.
Price, Edwin A. Kitchen chopping board. 4,447,051, Cl. 269-302.100.
Price, Stephen J.; and Hargreaves, Charles R., to Honeywell Inc. Metallic projectile body and thermoplastic rotating band. 4,446,795, Cl. 102-527.000.
Price, William L.; Murtha, John C.; Ross, James A., Jr.; Adam, Clyde E.; and Lucas, Kenneth R., to Westinghouse Electric Corp. Input-output buffers for a digital signal processing system. 4,447,873, Cl. 364-200.000.
Prince Corporation: *See*—
Marcus, Konrad H., 4,447,808, Cl. 340-696.000.
Pritikin, Nathan. Solid photoresist and method of making photoresist. 4,447,519, Cl. 430-275.000.
Pritsch, Eckhard: *See*—
Mundt, Johann; Kasper, Horst; and Pritsch, Eckhard, 4,447,788, Cl. 318-799.000.
Probst, Heinz: *See*—
Martini, Thomas; Schinzel, Erich; Frischkorn, Hans; Friedrich, Herbert; and Probst, Heinz, 4,447,350, Cl. 252-301.220.
Procter & Gambie Company, The: *See*—
Chappell, Charles W.; and Spletzer, Eldon G., 4,447,373, Cl. 264-4.000.
Loos, Patricia J.; Fuqua, Debra L.; and Drzewiecki, Paul J., 4,447,461, Cl. 426-589.000.
Osborn, Thomas W., III, 4,447,294, Cl. 162-158.000.
Tafuri, Michael W.; and Tao, Bernard Y., 4,447,462, Cl. 426-601.000.
Prometag AG: *See*—
Mewes, Claus J., 4,446,675, Cl. 53-535.000.
Proper, Frederick T.: *See*—
Stover, Richard W.; Proper, Frederick T.; and Young, Steven A., 4,447,061, Cl. 277-1.000.
Prosl, Frank R.: *See*—
DeCant, Leonard J., Jr.; Idriss, Samir F.; and Prosl, Frank R., 4,447,224, Cl. 604-67.000.
Prudhon, Francois; and Scicluna, Augustin, to Rhone-Poulenc Industries. Intimate contacting/separating of plural phases. 4,447,331, Cl. 210-721.000.

Prusik, Thaddeus: *See—*
Wang, Yu-Chang J.; Dursch, Friedrich; O'Laughlin, Richard L.; and Prusik, Thaddeus, 4,447,426, Cl. 424-243.000.

Prvni brnenska strojirna, narodni podnik: *See—*
Sirokorad, Jurij; and Vecera, Jiri, 4,446,741, Cl. 73-654.000.

Puchades, Jesus E. B.: *See—*
Spickett, Robert G. W.; Mauri, Jacinto M.; and Puchades, Jesus E. B., 4,447,417, Cl. 424-156.000.

Pugliese, Vincent; and Farcy, Jean-Claude, to Compagnie General d'Electricite. Laser amplifier. 4,447,789, Cl. 330-4.300.

Punako, Stephen; Davis, Alan L.; and Eifler, Raymond J., to Bendix Corporation, The. Socket contact for an electrical connector. 4,447,110, Cl. 339-262.0RR.

Puritz, E.: *See—*
Reidick, H.; Leithner, R.; Kirchhoff, F. J.; Puritz, E.; and Schluter, S., 4,446,911, Cl. 165-4.000.

Putt, Ronald A.; and Attia, Alan I., to Gould Inc. Method of treating thermoplastic surfaces. 4,447,471, Cl. 427-98.000.

Putz, John M.: *See—*
VanHorn, David D.; Putz, John M.; and Henderson, Alfred J., Jr., 4,447,865, Cl. 362-305.000.

Puvogel, Timothy J.; King, James D.; and Moore, David O., to Henny Penny Corporation. Food holding cabinet with stabilized air flow. 4,446,780, Cl. 99-480.000.

QMI Corporation: *See—*
Keable, John B., 4,447,468, Cl. 427-54.100.

Quadro, Giuseppe, to Ausonia Farmaceutici s.r.l. Thiazole derivative, and pharmaceutical compositions containing it. 4,447,419, Cl. 424-177.000.

Quella, Ferdinand; and Schmidt, Hans-Friedrich, to Siemens Aktiengesellschaft. Stabilized sulfur-containing resins, such as polyphenylene sulfide and method of producing same. 4,447,581, Cl. 525-189.000.

Quest Medical, Inc.: *See—*
Gula, John A.; Brady, John D.; Thompson, Thomas C.; and Alt, Joyce M., 4,447,230, Cl. 604-122.000.

Quick, Donald L., to Perkin-Elmer Corp., The. Programmable RF power regulator (stabilizer). 4,447,783, Cl. 323-275.000.

Quigley, Robert E., to American Seating Company. Automatic seating for telescoping row systems. 4,446,659, Cl. 52-9.000.

Quinn, David R., to Cordis Corporation. Infusion catheter system. 4,447,236, Cl. 604-169.000.

Quinn, Donald J.: *See—*
Davis, Larry A.; Boyce, Gregory H.; Mulloy, Timothy P.; Nebeker, Neil J.; Newman, Elmer C.; Quinn, Donald J.; and Adamson, David L., 4,447,307, Cl. 204-267.000.

Quintex Research International, Inc.: *See—*
Smith, George E., 4,446,730, Cl. 73-301.000.

Quist, Theodore M.: *See—*
Marcus, Stephen; and Quist, Theodore M., 4,447,149, Cl. 356-5.000.

Racal-Mesl Microwave Limited: *See—*
Gray, William P., 4,447,793, Cl. 333-106.000.

Raczynski, Walter V., to Inverse Square Systems Incorporated. Modular flash system. 4,447,859, Cl. 362-13.000.

Rader, Homer J., Jr. Take-up reel with controlled rewind velocity. 4,446,884, Cl. 137-355.230.

Rainford, Robert E.; Moser, Mark M.; and Ojala, Jon R., to International Business Machines Corporation. Method and apparatus for detecting defects in apertured plates. 4,447,152, Cl. 356-237.000.

Rairden, John R., III: *See—*
Jackson, Melvin R.; and Rairden, John R., III, 4,447,466, Cl. 427-34.000.

Ramer Test Tools, Inc.: *See—*
Palmer, John H., 4,447,077, Cl. 285-104.000.

Rametta, Anthony J., to Minnesota Mining & Manufacturing Company. Anaerobically-curing compositions. 4,447,588, Cl. 526-301.000.

Ransburg Corporation: *See—*
Allen, Harold T., 4,447,008, Cl. 239-214.130.

Rao, Chatty: *See—*
Hilbrans, Hermann; and Rao, Chatty, 4,447,261, Cl. 75-5.000.

Rasmussen, Jerald K.: *See—*
Driscoll, William A.; Heilmann, Steven M.; and Rasmussen, Jerald K., 4,447,493, Cl. 428-332.000.

Ratchford, Lloyd G.: *See—*
Werth, Dee A.; and Ratchford, Lloyd G., 4,447,103, Cl. 339-94.00M.

Rau, Karlheinz: *See—*
Christiansen, Uwe; Rau, Karlheinz; Steinkohl, Anton; and Streb, Bruno, 4,447,130, Cl. 350-310.000.

Raudat, John L., to Standard-Knapp, Inc. Method for drop packing small unstable articles. 4,446,672, Cl. 53-448.000.

Ray, Suprabhat: *See—*
Salman, Mohammad; Ray, Suprabhat; Kamboj, Ved P.; and Anand, Nitya, 4,447,622, Cl. 548-525.000.

Rayburn, Robert L.: *See—*
Watson, Robert L.; and Rayburn, Robert L., 4,446,864, Cl. 128-207.140.

Raynal, Serge: *See—*
Bergeret, Wilfrid; Gautier, Jean-Claude; Raynal, Serge; and Boileau, Sylvie, 4,447,584, Cl. 525-340.000.

RCA Corporation: *See—*
Faulkner, Richard D.; Henry, Dale V.; and Muth, David L., 4,447,758, Cl. 313-532.000.
Kurina, Miles J.; and Thornhill, John, 4,447,816, Cl. 343-877.000.
Lewis, Henry G., Jr.; and Eliscu, Steven M., 4,447,826, Cl. 358-27.000.
Matey, James R., 4,447,381, Cl. 264-107.000.

Reaver, Marvin G., Jr.: *See—*
Hagan, Edward F.; and Reaver, Marvin G., Jr., 4,446,625, Cl. 33-184.500.

Redmon, Billy L.; and Forester, Buford G., to Custom Oilfield Products, Inc. Variable high pressure choke. 4,446,887, Cl. 137-556.000.

Redwine, Michael A.: *See—*
Reed, Stewart D.; Sills, Arthur A.; Kraft, John H.; Houle, Raymond T.; Redwine, Michael A.; and Kilborn, Fredrick A., 4,446,586, Cl. 4-555.000.

Reeb, Irvin H., Jr.; and Beckhardt, Robert L., to Black & Decker Inc. Cordless electric device having contact increasing means. 4,447,749, Cl. 310-71.000.

Reed, Claude A., to International Food Equipment, Inc. Apparatus for heating food products. 4,446,775, Cl. 99-353.000.

Reed, Jerry A.: *See—*
Mathis, Ronald D.; and Reed, Jerry A., 4,447,597, Cl. 528-388.000.

Reed, Leonard W.; Barr, Robert M. S.; and Dick, David A., to Metal Box Limited. Apparatus for making thermoplastics articles. 4,447,199, Cl. 425-182.000.

Reed Lignin, Inc.: *See—*
Detroit, William J., 4,447,339, Cl. 252-8.50A.

Reed, Stewart D.; Sills, Arthur A.; Kraft, John H.; Houle, Raymond T.; Redwine, Michael A.; and Kilborn, Fredrick A., to Silchor. Apparatus and method for bathing invalids. 4,446,586, Cl. 4-555.000.

Reed Tool Company (Delaware): *See—*
Schumacher, Percy W., Jr., 4,446,935, Cl. 175-329.000.

Reefer Express Lines Pty., Ltd.: *See—*
Sugahara, Byron M.; Freelund, Avrum A.; and Zinger, George, 4,446,805, Cl. 114-76.000.

Reese, Morris T.: *See—*
MacNamee, Richard W.; Reese, Morris T.; and Blase, Emil F., 4,447,346, Cl. 252-62.200.

Reeves, Charles R., to Conver Corporation. Supplement to cross regulation in DC to DC converters. 4,447,866, Cl. 363-21.000.

Reid, Peter, to Westland plc. Apparatus for mounting a device above a helicopter rotor. 4,447,023, Cl. 244-17.110.

Reidick, H.; Leithner, R.; Kirchhoff, F. J.; Puritz, E.; and Schluter, S., to Apparatebau Rothemuhle Brandt & Kritzler GmbH. Regenerative preheater for two separate gas streams. 4,446,911, Cl. 165-4.000.

Reinersmann, Hans H.: *See—*
Kotzur, Joachim; Reinersmann, Hans H.; Albers, Rolf; Aschenbruck, Emil; and Neuhaus, Gunter, 4,447,063, Cl. 277-80.000.

Reinhardt, Rudolf: *See—*
Galtz, Rudiger; and Reinhardt, Rudolf, 4,447,187, Cl. 415-53.00R.

Rempel, William; and Kor, Bouko J., to Canadian CoOperative Implements Limited. Knife drive. 4,446,683, Cl. 56-296.000.

Renfro, Vernon E.; Gudgeon, Ronald L.; Clelland, John P.; and Cole, Clyde C., to United States of America, Navy. Aircraft loading adapter for use with ordnance lift vehicle. 4,447,186, Cl. 414-589.000.

Renga, James M., to Dow Chemical Company, The. Methylene coupling of aromatics. 4,447,650, Cl. 568-640.000.

Renner, Elmer J., to Allis-Chalmers Corporation. Return chain roller support for en masse conveyor. 4,446,963, Cl. 198-735.000.

Repro-Med Systems, Inc.: *See—*
Sealfon, Andrew; and Yurdin, Carl, 4,447,232, Cl. 604-134.000.

Research Against Cancer, Inc.: *See—*
Frisch, Eldon E.; and Parks, Leon C., 4,447,237, Cl. 604-175.000.

Research Hildings Pty. Limited: *See—*
Matkan, Josef, 4,447,516, Cl. 430-109.000.

Rettich, Donald R.: *See—*
Souder, James J., Jr.; Scarborough, Edward D., Jr.; Fox, Merlin D.; Rettich, Donald R.; and Mason, Robert L., 4,447,031, Cl. 248-280.100.

Reum, Helmut: *See—*
Boning, Bernward; Bone, Rainer; Nagel, Rudolf; Sellmaier, Franz; and Reum, Helmut, 4,446,723, Cl. 73-35.000.

Reuter, Helmut: *See—*
Moebus, Otto; Teuber, Michael; and Reuter, Helmut, 4,447,534, Cl. 435-161.000.

Reuther, Wolfgang; and Borck, Hans-Volker, to BASF Aktiengesellschaft. Wood preservative. 4,447,448, Cl. 424-285.000.

Rheinhold & Mahla Dammstoffe GmbH: *See—*
Ventker, Heinz; and Wendlinger, Fred, 4,447,490, Cl. 428-285.000.

Rheinische Braunkohlenwerke AG: *See—*
Lazik, Paul, 4,447,319, Cl. 209-11.000.

Rhone-Poulenc Agrochimie: *See—*
Lee, Guang-Huei, 4,447,634, Cl. 560-13.000.

Rhone-Poulenc Industries: *See—*
Faure, Alphonse; and Magne, Robert, 4,447,631, Cl. 556-469.000.
Prudhon, Francois; and Scicluna, Augustin, 4,447,331, Cl. 210-721.000.

Rice, Richard W.: *See—*
Fung, Shun C.; and Rice, Richard W., 4,447,551, Cl. 502-37.000.

Riceberg, Louis J.: *See—*
Ellis, James E.; Lidgard, Graham P.; Odstrchel, Gerald; and Riceberg, Louis J., 4,447,528, Cl. 435-7.000.

Richmann, Harold L.: *See—*
Breuker, Stephen J.; and Richmann, Harold L., 4,447,775, Cl. 324-438.000.

Rickman, James D., Jr. Selected segment heating or cooling system. 4,446,912, Cl. 165-12.000.

Ricoh Company, Ltd.: *See—*
Yuasa, Kazuhiro; and Furukawa, Noboru, 4,447,821, Cl. 346-154.000.

Riede, Gerhard; and Christopherson, Kjell H. I., to Gambro AG. Device for the diffusion of substances between two fluids via semipermeable membranes. 4,447,326, Cl. 210-321.300.

Riegert, Hermann: *See*—
Arndt, Manfred; Breier, Walter; Riegert, Hermann; Schmidt, Heinz; Schwarz, Hermann; and Warneke, Helmut. 4,446,978, Cl. 215-13.00R.

Rigterink, Preston D., to Chore-Time Equipment, Inc. Hanger for conveyor tubes and the like. 4,446,818, Cl. 119-52.0AF.

Rikagaku Kenkyusho: *See*—
Matsui, Masanao; and Ogawa, Tomoya. 4,447,605, Cl. 544-225.000.

Riley, Terence J.: *See*—
Hartman, Adrian R.; Kohl, James E.; MacPherson, William F.; and Riley, Terence J., 4,447,744, Cl. 307-252.00R.

Rines, Carol M.; and Marshall, Duane. Bottom margin indicator apparatus for typewriters and the like. 4,447,168, Cl. 400-708.000.

Rines, Robert H., to Academy of Applied Science, Inc., The. Method of and apparatus for combined optical and sonar detection and recording of objects. 4,447,896, Cl. 367-96.000.

Rippstein, Wayland J., Jr., to Aviation Chemical, Inc. Drift influencing composition. 4,447,413, Cl. 424-78.000.

Rittaler, Konstantin: *See*—
Fieber, Werner H.; Hinze, Klaus; Huth, Manfred K. O.; Jost, Hans-Georg; Lamm, Klaus D.; Michalski, Dieter; and Rittaler, Konstantin, 4,447,686, Cl. 200-153.00J.

Rittmann, Friedrich: *See*—
Zollner, Dieter H.; Lauterbach-Dammler, Inge; and Rittmann, Friedrich, 4,447,300, Cl. 204-67.000.

Rittscher, Dieter: *See*—
Baatz, Henning; Rittscher, Dieter; and Wriegt, Jurgen, 4,447,733, Cl. 250-506.100.

Rivier, Jean E. F.: *See*—
Olivera, Baldomero M.; Cruz, Lourdes J.; Gray, William R.; and Rivier, Jean E. F., 4,447,356, Cl. 260-112.50R.

Rivkin, Eric M.: *See*—
Miller, LeRoy; Thorud, Stanley R.; and Rivkin, Eric M., 4,446,660, Cl. 52-36.000.

Robert, Andre: *See*—
Heindl, Rudolf; and Robert, Andre, 4,447,305, Cl. 204-192.00C.

Robert Bosch GmbH: *See*—
Bleicher, Manfred; Buck, Manfred; Falchle, Jorg; and Wanner, Karl, 4,446,931, Cl. 173-48.000.
Boning, Bernward; Bone, Rainer; Nagel, Rudolf; Sellmaier, Franz; and Reum, Helmut, 4,446,723, Cl. 73-35.000.
Boruschewitz, Manfred; and Hamisch, Hansjoachim, 4,446,722, Cl. 73-35.000.

Robertson, Forrest E., to Acra-Plant, Inc. Ground penetrating tool for farm implement shanks. 4,446,927, Cl. 172-753.000.

Robinson, David S.; and Taylor, Rupert M., to Mhlume (Swaziland) Sugar Company Limited. Container tipping apparatus. 4,447,185, Cl. 414-420.000.

Rock, Gail A.; and Adams, George A. Plasma-free medium for platelet storage. 4,447,415, Cl. 424-101.000.

Rockwell International Corporation: *See*—
Gay, Richard L.; Kohl, Arthur L.; and Yosim, Samuel J., 4,447,262, Cl. 75-65.00R.
Hankosky, Andrew; and Clapper, Robert L., 4,447,036, Cl. 251-63.400.
Manasevit, Harold M., 4,447,497, Cl. 428-446.000.
Roos, Rudolf; and Federmann, Dieter, 4,447,086, Cl. 296-217.000.
Treise, Jan E., 4,447,814, Cl. 343-401.000.
Weber, James L., 4,446,949, Cl. 188-79.50K.

Roe, William J., to Nalco Chemical Company. Dewatering aids for coal and other mineral particulates. 4,447,344, Cl. 252-60.000.

Roeber, Artur: *See*—
Horn, Peter; Gehm, Robert; Marx, Matthias; and Roeber, Artur, 4,447,561, Cl. 521-118.000.

Rohm GmbH: *See*—
Pesch, Karl, 4,447,180, Cl. 409-232.000.

Rolls-Royce Limited: *See*—
Adkins, Richard C., 4,446,692, Cl. 60-39.230.
Campbell, David A., 4,447,190, Cl. 416-95.000.
Lucey, Desmond C., 4,446,766, Cl. 81-480.000.
Pidcock, Anthony; and Pask, George, 4,446,693, Cl. 60-39.320.

Roos, Rudolf; and Federmann, Dieter, to Rockwell International Corporation. Wind deflector for sliding roofs. 4,447,086, Cl. 296-217.000.

Rose, Wayne B.: *See*—
Gay, John C.; McCurdy, H. Dennis; and Rose, Wayne B., 4,447,414, Cl. 424-81.000.

Rosen, Terry J.: *See*—
Firth, Bruce E.; and Rosen, Terry J., 4,447,657, Cl. 568-783.000.

Rosenberg, Burkard: *See*—
Britschgi, Hugo; and Rosenberg, Burkard, 4,447,334, Cl. 210-783.000.

Rosenheck, Bernard M., to Litton Systems, Inc. Grating signal system using zero order beam of acousto-optic modulator. 4,447,134, Cl. 350-358.000.

Ross, David S.; Johnson, Robert M., Jr.; and Malhotra, Ripudaman, to Air Products and Chemicals, Inc. Beta-dicarbonyl compounds for the promotion of aromatic nitration by nitrogen tetroxide. 4,447,662, Cl. 568-939.000.

Ross, Gary. Visor. 4,446,571, Cl. 2-13.000.

Ross, James A., Jr.: *See*—
Price, William L.; Murtha, John C.; Ross, James A., Jr.; Adam, Clyde E.; and Lucas, Kenneth R., 4,447,873, Cl. 364-200.000.

Ross, Robert E.; and Gaugh, Wilbur S., to Eastman Kodak Company. Photographic elements containing 2,4-disulfonamidophenol scavengers for oxidized developing agents. 4,447,523, Cl. 430-505.000.

Rossello, Alain: *See*—
Lagrange, Alain; and Rossello, Alain, 4,447,855, Cl. 361-321.000.

Roth, Donald J.; Walter, John; and Kubis, Charles S., to Continental Packaging Company, Inc. Push-in closure. 4,446,984, Cl. 220-268.000.

Roth, Thomas E.; and Getman, Harlan R., to Vroman Foods, Inc. Method of and apparatus for producing and processing frozen confections. 4,447,458, Cl. 426-275.000.

Rothenberger GmbH & Co. Werkzeuge-Maschinen KG: *See*—
Velte, Karl-Heinz, 4,446,620, Cl. 30-96.000.

Rothman, Laura B.: *See*—
Logan, Joseph S.; Mauer, John L., IV; Rothman, Laura B.; Schwartz, Geraldine C.; and Standley, Charles L., 4,447,824, Cl. 357-71.000.

Rothmans of Pall Mall Canada Limited: *See*—
Brackman, Warren A., 4,446,876, Cl. 131-110.000.

Roussel Uclaf: *See*—
Ledelec, Lucien; Guillaume, Jacques; and Dumont, Claude, 4,447,438, Cl. 424-267.000.
Martel, Jacques; Buendia, Jean; and Nierat, Jeanine, 4,447,637, Cl. 560-124.000.
Teutsch, Jean G.; Costerousse, Germain; Philibert, Daniel; and Deraedt, Roger, 4,447,424, Cl. 424-238.000.

Rowe, William; Golda, Eugene; and Wilkes, Alan, to Polychrome Corporation. Method for making a negative working lithographic printing plate. 4,447,512, Cl. 430-17.000.

Rowlands, Reuben: *See*—
Bradbury, John A.; Rowlands, Reuben; and Tipping, James W., 4,447,491, Cl. 428-304.400.

Royal, Thomas A.: *See*—
Johanson, Jerry R.; and Royal, Thomas A., 4,446,717, Cl. 73-7.000.

Rozmus, Walter J., to Kelsey Hayes Company. Method for hot-consolidating powder using staged temperature and pressure causing compaction from the outside inward. 4,447,390, Cl. 419-49.000.

Rubin, Howard; and Weinerman, Brent. Connector for inhalation therapy apparatus. 4,446,863, Cl. 128-204.180.

Rubin, Irving N.: *See*—
Jimenez, Ivan; and Rubin, Irving N., 4,446,644, Cl. 42-1.0ST.

Rudy, Sol, to Alumin-Art Plating Company. Apparatus for holding a work piece. 4,447,049, Cl. 269-46.000.

Ruehl, William E., to Illinois Tool Works Inc. Terminal bridging adapter. 4,447,105, Cl. 339-113.00R.

Rumbaugh, Robert C.; and Jarrett, Robert B., to Motorola Inc. Adaptive dwell ignition system. 4,446,843, Cl. 123-609.000.

Runnells, Robert R.; Haak, Peter A.; Larkin, Rodney B.; and Vandervelden, C. Keith, to MDT Chemical Company. Combination steam and unsaturated chemical vapor sterilizer. 4,447,399, Cl. 422-113.000.

Rupchock, Patricia A.; and Tyhach, Richard J., to Miles Laboratories, Inc. Homogeneous specific binding assay with carrier matrix incorporating specific binding partner. 4,447,526, Cl. 435-7.000.

Rupchock, Patricia A.: *See*—
Greenquist, Alfred C.; Rupchock, Patricia A.; Tyhach, Richard J.; and Walter, Bert, 4,447,529, Cl. 435-7.000.

Rupp, Dallas B.: *See*—
Blosser, Virgil Y.; Isaksson, G. E.; Rupp, Dallas B.; and Singh, A. P., 4,447,385, Cl. 264-315.000.

Ruskin Manufacturing Company: *See*—
Hertel, Robert C., 4,446,667, Cl. 52-658.000.

Russell, Charles M., to Lummus Company, The. Dry cooling tower. 4,446,914, Cl. 165-129.000.

Russo, Robert V., to Mobil Oil Corporation. Compositions comprising a poly(methyl ethenyl benzene) resin and mineral oil. 4,447,575, Cl. 524-484.000.

Ruti-Te Strake B.V.: *See*—
Gunneman, Paul; and Jeuken, Gerardus W., 4,446,893, Cl. 139-11.000.

Rutkoski, John P., to Transat Corp. Apparatus for automatic measurement of equivalent circuit parameters of piezoelectric resonators. 4,447,782, Cl. 324-56.000.

Saar, David A.; and Bhagwat, Pradeep, to Black & Decker Inc. Waveform synthesizer and motor controller. 4,447,786, Cl. 318-811.000.

Sabo, Timothy A.: *See*—
Parker, Dane K.; and Sabo, Timothy A., 4,447,667, Cl. 585-469.000.

Sachs, Ekkehard: *See*—
Marquardt, Erich; and Sachs, Ekkehard, 4,447,687, Cl. 200-159.00R.

Sachtler GmbH Filmtechnische Gerate: *See*—
Jaumann, Leonhard; Tima, Zdenek; and Feierlein, Heinz, 4,447,033, Cl. 248-563.000.

Saga Petroleum a.s. & Co.: *See*—
Kristiansen, Olaf; and Brannstrom, Bo, 4,446,804, Cl. 114-74.00R.

Saimi, Tetsuo, to Matsushita Electric Industrial Co., Ltd. Optical information reading device. 4,447,722, Cl. 250-216.000.

Saito, Norihisa: *See*—
Watanabe, Masaru; Matsumura, Satoru; Amada, Takayoshi; Irie, Hiromitsu; and Saito, Norihisa, 4,447,293, Cl. 159-6.200.

Sakakibara, Naoji; Amano, Hiroyuki; and Morioka, Hiroaki, to Aisin Seiki Kabushiki Kaisha. Pressure modulating valve assembly. 4,446,889, Cl. 137-625.400.

Sakakibara, Naoji, to Aisin Seiki Kabushiki Kaisha. Speed control system for motor vehicle equipped with turbocharger. 4,446,940, Cl. 180-177.000.

Sakakibara, Susumu: *See*—
Yuge, Shizuo; Sakakibara, Susumu; Ishikawa, Takuma; Kito, Nobuo; and Yamamoto, Toshio, 4,447,517, Cl. 430-122.000.

Sakamoto, Hajimu; Kiyota, Takao; and Hayashi, Hiroshi, to Asahi Kasei Kogyo Kabushiki Kaisha; and Dainippon Pharmaceutical Co., Ltd. Method for stabilizing a tumor necrosis factor and a stable aqueous solution or powder containing the same. 4,447,355, Cl. 260-112.00B.

Sakamoto, Takashi: *See*—
Sano, Tetsuo; and Sakamoto, Takashi, 4,447,833, Cl. 358-298.000.

Sakane, Kazuo: *See*—
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, 4,447,429, Cl. 424-246.000.

Saks, Nelson S., to United States of America, Navy. Method for fabricating MNOS structures utilizing hydrogen ion implantation. 4,447,272, Cl. 148-1.500.

Salee, Gideon: *See*—
Scharf, Daniel J.; Ilardo, Charles S.; Schwartz, Willis T.; and Salee, Gideon, 4,447,572, Cl. 524-371.000.

Sallmann, Alfred, to Ciba-Geigy Corporation. Tri-substituted imidazole derivatives, pharmaceutical preparations containing them, and their use. 4,447,431, Cl. 424-246.000.

Sallnert, Kjell; Fridh, Carl-Erik; and Hansson, Manfred, to Platmanufaktur AB. Device for use in the manufacture of metal can tops with pull-up rings. 4,446,710, Cl. 72-10.000.

Salman, Mohammad; Ray, Suprabhat; Kamboj, Ved P.; and Anand, Nitya, to Council of Scientific and Industrial Research Rafi Marg. Preparation of l- and d-isomers of dl-3,4-trans-2,2-disubstituted-3,4-diarylchromans and derivatives thereof. 4,447,622, Cl. 548-525.000.

Sanchez, David F.: *See*—
Heredia de la Paz, Jorge A.; and Sanchez, David F., 4,446,888, Cl. 137-596.170.

Sander, Theo: *See*—
Wagener, Dietrich; Sander, Theo; and Laue, Karl H., 4,447,333, Cl. 210-750.000.

Sandered, Bror; Carlsson, Rune; and Andersson, Bengt, to MEAB, Mobile Equipment AB. Method and arrangement on extracting, reeling up, pulling in, etc., of a heavy cable or similar. 4,447,013, Cl. 242-54.00R.

Sanders, Robert J.: *See*—
Fuller, Robert T.; and Sanders, Robert J., 4,446,973, Cl. 211-45.000.

Sanfilippo, Aurora: *See*—
Franceschi, Giovanni; Marsili, Leonardo; Sanfilippo, Aurora; and Vioglio, Sergio, 4,447,432, Cl. 424-248.540.

Sangamo Weston, Inc.: *See*—
MacNamee, Richard W.; Reese, Morris T.; and Blase, Emil F., 4,447,346, Cl. 252-62.200.

Sani-Jon Mfg., Inc.: *See*—
Harding, George W.; and Sears, Ronald E., 4,446,585, Cl. 4-460.000.

Sankyo Company Limited: *See*—
Terahara, Akira; and Tanaka, Minoru, 4,447,626, Cl. 549-292.000.

Sano, Kenji: *See*—
Kondo, Syun-ichi; Sano, Kenji; and Sato, Hideo, 4,447,515, Cl. 430-83.000.

Sano, Tetsuo; and Sakamoto, Takashi, to Dainippon Screen Seizo Kabushiki Kaisha. Method for producing a halftone plate. 4,447,833, Cl. 358-298.000.

Sano, Yumiko: *See*—
Miyakawa, Nobuhiro; Higashiguchi, Teruaki; Sano, Yumiko; and Funato, Masatomi, 4,447,513, Cl. 430-58.000.

Sanshin Kogyo Kabushiki Kaisha: *See*—
Matsushita, Yukio; and Nozaki, Toshikatsu, 4,446,833, Cl. 123-435.000.

Santana, Manuel R.: *See*—
Panuska, Andrew J.; Santana, Manuel R.; and Sprow, Robert B., 4,446,686, Cl. 57-6.000.

Sapal, Societe Anonyme des Plieuses Automatiques: *See*—
Stalder, Heinz, 4,446,671, Cl. 53-445.000.

Sar-A-Lee, Inc.: *See*—
Schwartz, Charles A.; and Cornwell, Kenyon L., 4,447,464, Cl. 426-663.000.

Sargisson, Donald F.; and Harshman, Daniel L., to General Electric Company. Compound propulsor. 4,446,696, Cl. 60-226.300.

Sarin, Vinod K.; and Oberhauser, Peter, to GTE Laboratories Incorporated. Mining drill. 4,446,936, Cl. 175-410.000.

Sartinoranont, Sarnt. Tampon inserter. 4,447,222, Cl. 604-15.000.

Sasaki, Yutaka; and Nakamura, Yoshimi, to Nitto Chemical Industry Co., Ltd. Process for producing an antimony containing metal oxide catalyst. 4,447,558, Cl. 502-215.000.

Sasse, Klaus: *See*—
Dickore, Karlfried; Sasse, Klaus; Eue, Ludwig; and Schmidt, Robert R., 4,447,258, Cl. 71-93.000.

Sato, Fumihiko: *See*—
Takeo, Kimihiko; Hirano, Tooichiro; and Sato, Fumihiko, 4,447,601, Cl. 536-102.000.

Sato, Hideo: *See*—
Kondo, Syun-ichi; Sano, Kenji; and Sato, Hideo, 4,447,515, Cl. 430-83.000.

Sato, Kazusuke: *See*—
Kimura, Etsuji; Ogi, Katsumi; Sato, Kazusuke; and Hashimoto, Mayuki, 4,447,045, Cl. 266-149.000.

Saunders, Howard E.; Westervelt, Dean C.; and Elbling, Irving N., to Westinghouse Electric Corp. Insulated conductor having adhesive overcoat. 4,447,797, Cl. 336-205.000.

Savage, David S.: *See*—
Carlyle, Ian C.; Savage, David S.; and Sleigh, Thomas, 4,447,425, Cl. 424-241.000.

Savora, Gunther: *See*—
Marsoner, Hermann J.; and Savora, Gunther, 4,446,872, Cl. 128-700.000.

Scarborough, Edward D., Jr.: *See*—
Souder, James J., Jr.; Scarborough, Edward D., Jr.; Fox, Merlin D.; Rettich, Donald R.; and Mason, Robert L., 4,447,031, Cl. 248-280.100.

Schaad, William J.; Black, Charles E., III; and Halstead, Raymond T., to Indak Manufacturing Corp. Push button switches having improved carriage, contactor and contact constructions. 4,447,688, Cl. 200-159.00R.

Schaefer, Klaus-Dieter: *See*—
Heitmann, Knut; and Schaefer, Klaus-Dieter, 4,447,143, Cl. 354-407.000.

Schafer, Werner: *See*—
Berthold, Joachim; Diedrich, Bernd; Franke, Rainer; Hartlapp, Jurgen; Schafer, Werner; and Strobel, Wolfgang, 4,447,587, Cl. 526-124.000.

Scharf, Daniel J.; Ilardo, Charles S.; Schwartz, Willis T.; and Salee, Gideon, to Occidental Chemical Corporation. Fire retardant polyamide. 4,447,572, Cl. 524-371.000.

Scharmann GmbH & Co.: *See*—
Esser, Karl-Josef, 4,447,178, Cl. 409-80.000.

Scharrer, Roland P. F.; Schluenz, Robert W.; and Kramss, Richard H., to Arizona Chemical Company. Method for making oxidation-stable, light-colored glycerol ester of modified rosin. 4,447,354, Cl. 260-106.000.

Schatteman, Etienne A.; and d'Alayer de Costemore d'Arc, Stephane M. A., to Staar S. Automatic video disc inverting mechanism. 4,447,900, Cl. 369-200.000.

Schayes, Raymond G. G.; Gustin, Pol A. G. J.; Bodart, Robert; and Berck, Michel F. D. J., to U.S. Philips Corp. Facsimile transmission arrangement. 4,447,829, Cl. 358-260.000.

Scheinhaus, Myron G. J.; Jacobson, Paul R.; and Selner, Allen J. Biomechanical footwear. 4,446,633, Cl. 36-11.500.

Schellhammer, Carl-Wolfgang; and Wehling, Bernhard, to Bayer Aktiengesellschaft. 1,4-Bis-(4-chloro-2-methoxystyryl)-benzene. 4,447,651, Cl. 568-645.000.

Schicker, James R.: *See*—
Lula, James W.; and Schicker, James R., 4,447,565, Cl. 523-219.000.

Schider, Siegfried: *See*—
Otte, Wolf-Dieter; Otte, Heinz; Schider, Siegfried; and Wiesner, Otto, 4,446,857, Cl. 128-92.0BC.

Schiller, Werner, to Max Kammerer GmbH. Slide actuated, snap acting multiple rocker switch. 4,447,689, Cl. 200-330.000.

Schilling, Peter: *See*—
Schreuders, Hans G.; and Schilling, Peter, 4,447,269, Cl. 106-277.000.

Schimmelpfennig, Hans, to Siemens Aktiengesellschaft. Method of casting a printing head for an ink jet printer. 4,447,375, Cl. 264-40.500.

Schinzel, Erich: *See*—
Martini, Thomas; Schinzel, Erich; Frischkorn, Hans; Friedrich, Herbert; and Probst, Heinz, 4,447,350, Cl. 252-301.220.

Schlamm, Heinz-Werner: *See*—
Gundel, Manfred; Schlamm, Heinz-Werner; and Schmitz, Klaus-Dieter, 4,447,806, Cl. 340-641.000.

Schluenz, Robert W.: *See*—
Scharrer, Roland P. F.; Schluenz, Robert W.; and Kramss, Richard H., 4,447,354, Cl. 260-106.000.

Schluter, S.: *See*—
Reidick, H.; Leithner, R.; Kirchhoff, F. J.; Puritz, E.; and Schluter, S., 4,446,911, Cl. 165-4.000.

Schmadeke, Donald W.: *See*—
Antenore, Donald E.; Schmadeke, Donald W.; and Stewart, Rodney A., 4,447,463, Cl. 426-603.000.

Schmid, Frederick L., to United States of America, Energy. Grapple assembly. 4,447,085, Cl. 294-97.000.

Schmidt, Gunther: *See*—
Trummlitz, Gunter; Engel, Wolfhard; Eberlein, Wolfgang; Schmidt, Gunther; Hammer, Rudolf; and del Soldato, Piero, 4,447,434, Cl. 424-256.000.

Schmidt, Hans-Friedrich: *See*—
Quella, Ferdinand; and Schmidt, Hans-Friedrich, 4,447,581, Cl. 525-189.000.

Schmidt, Heinz: *See*—
Arndt, Manfred; Breier, Walter; Riegert, Hermann; Schmidt, Heinz; Schwarz, Hermann; and Warneke, Helmut, 4,446,978, Cl. 215-13.00R.

Schmidt, Robert R.: *See*—
Dickore, Karlfried; Sasse, Klaus; Eue, Ludwig; and Schmidt, Robert R., 4,447,258, Cl. 71-93.000.

Schmitt, Armin, to LUWA AG. Apparatus for the mechanical/thermal treatment, including sterilization and pasteurization, of fluids. 4,446,781, Cl. 99-483.000.

Schmitz, Klaus-Dieter: *See*—
Gundel, Manfred; Schlamm, Heinz-Werner; and Schmitz, Klaus-Dieter, 4,447,806, Cl. 340-641.000.

Schnegg, Peter: *See*—
Emde, Herbert; Blank, Heinz U.; and Schnegg, Peter, 4,447,368, Cl. 260-508.000.

Schnettler, Richard A.: *See*—
Grisar, J. Martin; Schnettler, Richard A.; and Dage, Richard C., 4,447,619, Cl. 548-318.000.

Schoenfeld, Harald, to Carl Schenck AG. Crankshaft balance centering. 4,446,732, Cl. 73-461.000.

Scholl, Hans, to Kochs Adler AG. Automatic sewing machines. 4,446,802, Cl. 112-121.120.

Schoolman, William K.; Griman, George A.; and Andrews, Frank D., to Mastic Corporation. Counterbalance lock mechanism for a window assembly. 4,446,654, Cl. 49-181.000.

Schornick, Gunnar: *See*—
Henne, Andreas; Hesse, Anton; Jacobi, Manfred; Schornick, Gunnar; Vyvial, Rudolf; and Holoch, Klaus, 4,447,520, Cl. 430-281.000.

Schossow, George W.; and Stallings, George P. Electrical safety switch for electrical appliances. 4,447,844, Cl. 361-77.000.

Schott, Eberhard P.; and Lang, Hans, to BASF Aktiengesellschaft. Plant growth regulators. 4,447,255, Cl. 71-86.000.

Schreuders, Hans G.; and Schilling, Peter, to Westvaco Corporation. Cationic aqueous bituminous emulsion-aggregate slurries. 4,447,269, Cl. 106-277.000.

Schuck, Thomas W., to Air Products and Chemicals, Inc. High pressure helium pump for liquid or supercritical gas. 4,447,195, Cl. 417-570.000.

Schuetz, Jeffrey M.: *See*—
Lustig, Stanley; Schuetz, Jeffrey M.; and Vicik, Stephen J., 4,447,480, Cl. 428-35.000.

Schulte, Eric, to Texas Instruments Incorporated. Method for via formation in HgCdTe. 4,447,291, Cl. 156-643.000.

Schultz, Charles R.; Tollefson, Mark S.; and Wuertz, Howard A. Apparatus for burying drip irrigation tubing. 4,447,173, Cl. 405-181.000.

Schulz, Frank C., Jr. Volumetric analysis device for determining the dry rubber content of latex. 4,446,725, Cl. 73-61.00R.

Schumacher, Percy W., Jr., to Reed Tool Company (Delaware). Intermittent high-drag oil well drilling bit. 4,446,935, Cl. 175-329.000.

Schuster-Woldan, Hans; Buerk, Hermann; Koch, Dirk; and Weingand, Kaspar, to Siemens Aktiengesellschaft. Method for manufacturing unsupported metal lattice structures. 4,447,292, Cl. 156-644.000.

Schwander, Hansrudolf; and Furrer, Peter, to Ciba-Geigy Corporation. Monoazo compounds. 4,447,358, Cl. 260-205.000.

Schwartz, Bertram: *See*—
Dixon, Richard W.; Koszi, Louis A.; Miller, Richard C.; and Schwartz, Bertram, 4,447,905, Cl. 372-46.000.

Schwartz, Charles A.; and Cornwell, Kenyon L., to Sar-A-Lee, Inc. Method of processing margarine or butter for squeeze packet containers. 4,447,464, Cl. 426-663.000.

Schwartz, Eugene B.: *See*—
Kaye, Gordon E.; Schwartz, Eugene B.; and Sollins, Irving V., 4,447,223, Cl. 604-61.000.

Schwartz, Geraldine C.: *See*—
Logan, Joseph S.; Mauer, John L., IV; Rothman, Laura B.; Schwartz, Geraldine C.; and Standley, Charles L., 4,447,824, Cl. 357-71.000.

Schwartz, Henry D.; Krull, Irwin H.; Clement, Carl P.; Stengel, Frederick H.; and Hayslett, David D., to Sequioa Turner. Sample container for measurement of ions of body fluids. 4,447,398, Cl. 422-102.000.

Schwartz, Willis T.: *See*—
Scharf, Daniel J.; Ilardo, Charles S.; Schwartz, Willis T.; and Salee, Gideon, 4,447,572, Cl. 524-371.000.

Schwarz, Hermann: *See*—
Arndt, Manfred; Breier, Walter; Riegert, Hermann; Schmidt, Heinz; Schwarz, Hermann; and Warneke, Helmut, 4,446,978, Cl. 215-13.00R.

Schwarzkopf Development Corporation: *See*—
Otte, Wolf-Dieter; Otte, Heinz; Schider, Siegfried; and Wiesner, Otto, 4,446,857, Cl. 128-92.0BC.

Schwer, John W. Method and composition for foaming slag in electric arc furnace. 4,447,265, Cl. 75-257.000.

Schwesig, Guenter; and Blaschke, Felix, to Siemens Aktiengesellschaft. Device for the field-oriented operation of a converter-fed asynchronous machine. 4,447,787, Cl. 318-803.000.

Scicluna, Augustin: *See*—
Prudhon, Francois; and Scicluna, Augustin, 4,447,331, Cl. 210-721.000.

Scott, Ted R.: *See*—
Lafevers, James O.; Kushmaul, Richard T.; and Scott, Ted R., 4,447,097, Cl. 312-215.000.

Scovill Inc.: *See*—
Martin, Keith S., 4,446,731, Cl. 73-334.000.

Scovill, John P.: *See*—
Klayman, Daniel L.; Scovill, John P.; Bartosevich, Joseph F.; Mason, Carl J.; and Griffin, T. Scott, 4,447,427, Cl. 424-244.000.

Sealfon, Andrew; and Yurdin, Carl, to Repro-Med Systems, Inc. Spring-operated liquid-dispensing device. 4,447,232, Cl. 604-134.000.

Seaman Corporation: *See*—
Seaman, Donald R., 4,447,288, Cl. 156-574.000.

Seaman, Donald R., to Seaman Corporation. Seam welder for thermoplastic coated fabric. 4,447,288, Cl. 156-574.000.

Sears, Ronald E.: *See*—
Harding, George W.; and Sears, Ronald E., 4,446,585, Cl. 4-460.000.

SECEMIA: *See*—
Book, Gerard, 4,446,630, Cl. 34-65.000.

Sedat, Georges A., to Etat Francais represente par le Delegue General pour l'Armement. Castable pyrotechnic composition with a chlorinated binder. 4,447,278, Cl. 149-19.910.

Seeburg, Peter H.: *See*—
Goodman, Howard M.; Shine, John; and Seeburg, Peter H., 4,447,538, Cl. 435-253.000.

Sefko, John; and Pavlik, Norman M., to United States of America, Energy. Laminated grid and web magnetic cores. 4,447,795, Cl. 336-178.000.

Segal, William J.: *See*—
Nguyen, Liem; Segal, William J.; and Friend, Kent, 4,447,091, Cl. 301-37.0AT.

Segar, William R.; and Larson, Robert A., to Westinghouse Electric Corp. Power collection apparatus for a transportation system. 4,447,680, Cl. 191-48.000.

Segawa, Hirohisa: *See*—
Mizuno, Takaji; Suwahara, Hiroshi; and Segawa, Hirohisa, 4,447,702, Cl. 219-130.330.

Seider, Werner: *See*—
Bubik, Alfred; Dahl, Hans; Holik, Herbert; Kurtz, Rudiger; and Seider, Werner, 4,447,295, Cl. 162-300.000.

Seiffhart, John B.: *See*—
Hubbard, Raymond W.; Seiffhart, John B.; and Hubbard, Thomas, 4,446,779, Cl. 99-472.000.

Seiko Instruments & Electronics Ltd.: *See*—
Mitamura, Gen; Eguchi, Takao; and Nagami, Yukio, 4,447,162, Cl. 368-295.000.
Miyoshi, Taisuke, 4,447,133, Cl. 350-357.000.
Ochiai, Osamu, 4,447,753, Cl. 310-312.000.
Tsukada, Nobuo; and Nishida, Isamu, 4,447,163, Cl. 368-319.000.

Sekiguchi, Kiyonori; Igashira, Toshihiko; Tanaka, Takeshi; Kawai, Hisasi; Yamada, Mitsumasa; Kawagoe, Michio; and Tanaka, Masaaki, to Nippon Soken, Inc.; and Toyota Jidosha Kabushiki Kaisha. Method and apparatus for controlling exhaust gas recirculation in a diesel engine. 4,446,839, Cl. 123-569.000.

Sekisu Kagaku Kogyo Kabushiki Kaisha: *See*—
Kamiyama, Fumio; Yamazaki, Kazutoshi; Kohara, Minoru; and Nagata, Mituo, 4,447,328, Cl. 210-635.000.

Selas Corporation of America: *See*—
Grever, Arnold J., 4,447,690, Cl. 219-10.430.

Selfix, Inc.: *See*—
Chap, John P., 4,446,642, Cl. 40-152.100.

Seligman, Paul A.: *See*—
Allen, Robert H.; and Seligman, Paul A., 4,447,547, Cl. 436-543.000.

Sellmaier, Franz: *See*—
Boning, Bernward; Bone, Rainer; Nagel, Rudolf; Sellmaier, Franz; and Reum, Helmut, 4,446,723, Cl. 73-35.000.

Selner, Allen J.: *See*—
Scheinhaus, Myron G. J.; Jacobson, Paul R.; and Selner, Allen J., 4,446,633, Cl. 36-11.500.

Sen-Yi, Lin. Wrist bracelet clasp. 4,446,604, Cl. 24-68.00J.

Senes, Michel: *See*—
Hamon, Christian; Bandiera, Jean; and Senes, Michel, 4,447,669, Cl. 585-640.000.

Sequioa Turner: *See*—
Schwartz, Henry D.; Krull, Irwin H.; Clement, Carl P.; Stengel, Frederick H.; and Hayslett, David D., 4,447,398, Cl. 422-102.000.

Seredich, Douglas: *See*—
Hetzel, Frederick; Graf, Martin J.; and Seredich, Douglas, 4,447,861, Cl. 362-216.000.

Sestanj, Kazimir, to Ayerst, McKenna & Harrison Inc. N[(2-Naphthalenyl)thioxomethyl]glycine derivatives. 4,447,452, Cl. 424-319.000.

Sewerinson, Ake N., to AEL Microtel, Ltd. Forward error correction using coding and redundant transmission. 4,447,903, Cl. 371-68.000.

Shaffer, James E.; and Distin, Robert G., Jr., to Advanced Energy Concepts '81, Ltd. Epicycloidal gears and gear tooth arrangement therefor. 4,446,752, Cl. 74-462.000.

Shah, Jayantkumar R.: *See*—
Elliott, George; Lenk, Pedro A.; and Shah, Jayantkumar R., 4,447,673, Cl. 179-18.0HB.

Shang, Jer-Yu; Notestein, John E.; Mei, Joseph S.; and Zeng, Li-Wen, to United States of America, Energy. Combined fluidized bed retort and combustor. 4,447,297, Cl. 202-99.000.

Shankar, Srinivasan: *See*—
Dardi, Louis E.; and Shankar, Srinivasan, 4,447,503, Cl. 428-632.000.

Shanklin Corporation: *See*—
Shanklin, Frank G.; and McConnell, James A., 4,447,284, Cl. 156-366.000.

Shanklin, Frank G.; and McConnell, James A., to Shanklin Corporation. Seal arm latching mechanism for heat sealing apparatus. 4,447,284, Cl. 156-366.000.

Shanks, Bruce E., to General Electric Company. Sealed beam lamp unit sealing surfaces. 4,447,862, Cl. 362-267.000.

Shannon, Richard F.; and Helser, Jerry L., to Owens-Corning Fiberglas Corporation. Expanded inorganic aggregate bonded with calcium silicate hydrate as thermal insulation. 4,447,380, Cl. 264-82.000.

Shapiro, Ira P., to Burroughs Corporation. Processor select switch. 4,447,798, Cl. 377-55.000.

Sharp Kabushiki Kaisha: *See*—
Haneda, Isamu, 4,447,889, Cl. 364-900.000.
Kawaguchi, Masashi; Ishii, Toshiaki; Isaka, Kinichi; and Uede, Hisashi, 4,447,757, Cl. 313-509.000.
Wada, Yoshihiro, 4,447,884, Cl. 364-557.000.
Zibu, Mitsuo, 4,447,892, Cl. 365-156.000.

Sharp, Michael R. G.; and Braithwaite, John C., to British Gas Corporation. Magnetic pipeline inspection vehicle with metallic foil and bristle contacts supporting the vehicle. 4,447,777, Cl. 324-220.000.

Shaw, Leslie V.: *See*—
Stubbersfield, Edgar M.; and Shaw, Leslie V., 4,446,623, Cl. 30-229.000.

Shen, Sin-Yan, to United States of America, Energy. Sonic resonator control and method for determining component concentration in multiple component molten liquids. 4,447,301, Cl. 204-67.000.

Shepherd, Orr, to Visidyne, Inc. Precision drive system. 4,447,770, Cl. 318-618.000.

Sherwood, Cy E.: *See*—
Dyce, John W.; Waters, Edwin R.; and Sherwood, Cy E., 4,447,100, Cl. 339-14.00R.

Shibata, Takuo: *See*—
Ogawa, Kazufumi; Chikamura, Takao; and Shibata, Takuo, 4,447,720, Cl. 250-211.00J.

Shibuya, Masahide: *See*—
Masujima, Sho; Shibuya, Masahide; Shoichi, Iwaya; Umeda, Kenichi; Oikawa, Yasunobu; Abe, Hisao; Midori, Yoshifumi; Fujiwara, Shinobu; and Kikuchi, Nobuaki, 4,447,549, Cl. 501-138.000.

Shibuya, Yasutaka: *See*—
Kodama, Kazuyuki; Endo, Takeyuki; Okada, Kunihiro; and Shibuya, Yasutaka, 4,447,809, Cl. 340-747.000.

Shields, John: *See*—
Biggs, Delmar A.; and Shields, John, 4,447,725, Cl. 250-339.000.

Shigeoka, Katsuhei: *See*—
Tamura, Hitoshi; and Shigeoka, Katsuhei, 4,447,384, Cl. 264-206.000.

Shigeru, Kitahara; Okane, Isao; Shirai, Katsuyuki; and Morimura, Tosio, to National Research Institute for Metals; and Showa Denko Kabushiki Kaisha. Ceramic based composite material for flame spraying. 4,447,501, Cl. 428-570.000.

Shiiki, Zenya: *See*—
Katto, Takayuki; Komatsu, Yasumasa; and Shiiki, Zenya, 4,447,578, Cl. 525-75.000.

Shimada, Masahiko: *See*—
Watanabe, Kiyoshi; Ideguchi, Satoshi; Ogura, Masahiro; Shimada, Masahiko; and Kawaharada, Hajime, 4,447,362, Cl. 260-396.00R.

Shimano Industrial Company Limited: *See*—
Nagano, Masashi, 4,446,753, Cl. 74-594.100.

Shimizu, Tokuzo. Tape cartridge of cassette system. 4,447,021, Cl. 242-199.000.

Shimp, David A., to Celanese Corporation. Metal fluoborate catalyzed hindered aromatic amine curing agents for polyepoxide resins. 4,447,586, Cl. 525-504.000.

Shine, John: *See*—
Goodman, Howard M.; Shine, John; and Seeburg, Peter H., 4,447,538, Cl. 435-253.000.

Shinke, Shuzo: *See*—
Hoshiyama, Satoshi; Muto, Hiroyuki; Shinke, Shuzo; Otsuka, Kanji; Takigawa, Shinichiro; and Yamazaki, Hiroyuki, 4,447,661, Cl. 568-882.000.

Shioyama, Giichi: *See*—
Nakagawa, Toyoaki; Nakajima, Masao; Kawamura, Yoshihisa; and Shioyama, Giichi, 4,446,840, Cl. 123-571.000.

Shirahata, Ryuji: *See*—
Kitamoto, Tatsuji; and Shirahata, Ryuji, 4,446,816, Cl. 118-718.000.

Shirai, Katsuyuki: *See*—
Shigeru, Kitahara; Okane, Isao; Shirai, Katsuyuki; and Morimura, Tosio, 4,447,501, Cl. 428-570.000.

Shiraki, Manabu: *See*—
Ban, Itsuki; Shiraki, Manabu; and Egami, Kazuhito, 4,447,751, Cl. 310-154.000.

Shitori, Yoshiyasu: *See*—
Ogura, Haruo; Furuhata, Kimio; Osawa, Toshiaki; Toyoshima, Satoshi; Shitori, Yoshiyasu; and Ito, Masayoshi, 4,447,600, Cl. 536-23.000.

Shkolnik, David; and Slonimsky, Alla. Device for determining angle of inclination of ship. 4,446,628, Cl. 33-366.000.

Shoemaker, Gerald L.: *See*—
Fowles, Patrick E.; Shoemaker, Gerald L.; and Yan, Tsoung-Yuan, 4,447,311, Cl. 208-35.000.

Shofu, Inc.: *See*—
Kawai, Masakatsu, 4,447,208, Cl. 433-166.000.

Shoichi, Iwaya: *See*—
Masujima, Sho; Shibuya, Masahide; Shoichi, Iwaya; Umeda, Kenichi; Oikawa, Yasunobu; Abe, Hisao; Midori, Yoshifumi; Fujiwara, Shinobu; and Kikuchi, Nobuaki, 4,447,549, Cl. 501-138.000.

Showa Denko Kabushiki Kaisha: *See*—
Shigeru, Kitahara; Okane, Isao; Shirai, Katsuyuki; and Morimura, Tosio, 4,447,501, Cl. 428-570.000.

Shur Medical Corporation: *See*—
Heinzelman, Bert D.; Spranger, Douglas M.; Brookes, Malcolm J.; and Kuphal, John E., 4,447,482, Cl. 428-42.000.

Sico Incorporated: *See*—
Wilson, Kermit H.; and Carlson, Ronald R., 4,446,796, Cl. 108-69.000.

Siegal, Burton L., to Acme Steel Door Corp. End channel member for space dividing system panel. 4,446,669, Cl. 52-738.000.

Siemens Aktiengesellschaft: *See*—
Alexandrescu, Mircea; and Haendle, Joerg, 4,447,827, Cl. 358-111.000.
Grimmer, Rudolf, 4,447,564, Cl. 523-200.000.
Harbauer, Werner; Drexler, Johann; and Flierl, Erwin, 4,447,794, Cl. 335-128.000.
Hjorring, Hans, 4,447,909, Cl. 375-88.000.
Quella, Ferdinand; and Schmidt, Hans-Friedrich, 4,447,581, Cl. 525-189.000.
Schimmelpfennig, Hans, 4,447,375, Cl. 264-40.500.
Schuster-Woldan, Hans; Buerk, Hermann; Koch, Dirk; and Weingand, Kaspar, 4,447,292, Cl. 156-644.000.
Schwesig, Guenter; and Blaschke, Felix, 4,447,787, Cl. 318-803.000.
Wager, Mats; and Hirschberg, Jakub, 4,447,053, Cl. 271-113.000.
Walz, Joachim, 4,447,882, Cl. 364-521.000.

Siemens-Allis, Inc.: *See*—
Emde, Herbert; Blank, Heinz U.; and Schnegg, Peter, 4,447,368, Cl. 260-508.000.
Farag, Samir F.; Hoffmann, Alvin R.; and Kleinecke, John D., 4,447,858, Cl. 361-429.000.

Siemens Gammasonics, Inc.: *See*—
Groch, Mark W.; and Domnanovich, James R., 4,446,873, Cl. 128-715.000.

Sievers, Henry T., to Cooper Industries, Inc. Adjustable wrench adjusting mechanism. 4,446,764, Cl. 81-170.000.

SIG-Schweizerische Industrie-Gesellschaft: *See*—
Grundler, Bruno, 4,446,676, Cl. 53-552.000.

Signode Corporation: *See*—
Gurak, Ronald W.; and Diploma, Eduardo P., 4,446,784, Cl. 100-27.000.

Sigyo, Keiichi: *See*—
Omae, Yoshihiro; Okubo, Noboru; Sigyo, Keiichi; Nakajima, Hideo; Fukui, Hiroaki; Yamada, Toshio; and Honda, Hideyuki, 4,447,805, Cl. 340-539.000.

Sih, John C.; and Lin, Chiu-Hong, to Upjohn Company, The. Imidazolyl-substituted benzothiophenes. 4,447,620, Cl. 548-336.000.

Silchor: *See*—
Reed, Stewart D.; Sills, Arthur A.; Kraft, John H.; Houle, Raymond T.; Redwine, Michael A.; and Kilborn, Fredrick A., 4,446,586, Cl. 4-555.000.

Sills, Arthur A.: *See*—
Reed, Stewart D.; Sills, Arthur A.; Kraft, John H.; Houle, Raymond T.; Redwine, Michael A.; and Kilborn, Fredrick A., 4,446,586, Cl. 4-555.000.

Simko, Aladar O.; Havstad, Peter H.; and Harrington, Joseph A., to Ford Motor Company. Method of operating an engine with a high heat of vaporization fuel. 4,446,830, Cl. 123-276.000.

Simm, Manfred; Spiess, Karl-Heinz; and Weiss, Richard, to Dynamit Nobel Aktiengesellschaft. Shaped article of a synthetic resin and/or natural rubber and process for the production thereof. 4,447,488, Cl. 428-213.000.

Simmons, Bjorn, to Aktiebolaget Bofors. Practice shell particularly useful for training purposes. 4,446,794, Cl. 102-513.000.

Simmons, Peter E., to Imperial Chemical Industries Limited. Trip system. 4,447,851, Cl. 361-189.000.

Simon, Clarence W. Apparatus and method for mixing particulate material. 4,447,158, Cl. 366-297.000.

Simpson, Colin A., to Graviner Limited. Detection of light-affecting substance in a fluid. 4,447,155, Cl. 356-437.000.

Simpson, Howard D.: *See*—
Miller, J. Wayne; and Simpson, Howard D., 4,447,317, Cl. 208-216.00R.

Simpson, William E., Jr., to Lockheed Corporation. Continuity actuated isolation valve assembly. 4,446,890, Cl. 137-87.000.

Sinclair, Ian, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Social Services in Her Britannic Majesty's Government of the. Method and apparatus for detecting the presence of a contaminant in a gaseous carrier. 4,446,720, Cl. 73-23.000.

Singer Company, The: *See*—
Peterson, Wesley R., 4,446,621, Cl. 30-241.000.

Singh, A. P.: *See*—
Blosser, Virgil Y.; Isaksson, G. E.; Rupp, Dallas B.; and Singh, A. P., 4,447,385, Cl. 264-315.000.

Sirmans, John J. Glass cutter device. 4,446,768, Cl. 83-879.000.

Sirokorad, Jurij; and Vecera, Jiri, to Prvni brnenska strojirna, narodni podnik. Vibration transducer. 4,446,741, Cl. 73-654.000.

SK&F Lab Co.: *See*—
Labaw, Clifford S.; and Wellman, George R., 4,447,621, Cl. 548-342.000.

Sleigh, Thomas: *See*—
Carlyle, Ian C.; Savage, David S.; and Sleigh, Thomas, 4,447,425, Cl. 424-241.000.

Sloane, Michael W., Sr.: *See*—
Cooper, Larry V.; and Sloane, Michael W., Sr., 4,446,610, Cl. 29-421.00E.

Slonimsky, Alla: *See*—
Shkolnik, David; and Slonimsky, Alla, 4,446,628, Cl. 33-366.000.

Slosberg, David K.; and Nowell, Gilbert S., to Compo Industries, Inc. Flame-resistant vinyl foam gasket and method of preparation. 4,447,484, Cl. 428-137.000.

Slosberg, David M.: *See*—
Bradley, John J.; Franklin, Benjamin S.; Slosberg, David M.; Appell, Marc; Cassonnet, Jean-Claude; and De Sabatier, Philippe D., 4,447,874, Cl. 364-200.000.

Smallegan, Jon M.: *See*—
Trudeau, William H.; Gaines, Donald R.; and Smallegan, Jon M., 4,447,094, Cl. 308-2.00R.

Smith, Clay D.; and Keller, Douglas V., Jr., to Otisca Industries, Ltd. Methods of cleaning coal. 4,447,245, Cl. 44-1.0SR.

Smith, Clifford E.; Mark, Harold W.; Louthan, Rector P.; and Efner, Howard F., to Phillips Petroleum Company. Diesel fuel. 4,447,246, Cl. 144-57.000.

Smith, Donald C.; Snow, Richard F.; and Pauli, George B., to Crouse-Hinds Company. Post top luminaire. 4,447,864, Cl. 362-311.000.

Smith, Earl F.; and McRae, Daniel D., to Harris Corporation. Phase tracking correction scheme for high frequency modem. 4,447,910, Cl. 375-99.000.

Smith, George E., to Qwintex Research International, Inc. Specific gravity independent gauging of liquid filled tanks. 4,446,730, Cl. 73-301.000.

Smith, Grant M., to Sony Corporation. Method and apparatus for single frame recording on video tape. 4,447,835, Cl. 360-10.200.

Smith, Lawrence A., Jr.; Jones, Edward M., Jr.; and Hearn, Dennis, to Chemical Research & Licensing Company. Process for producing high purity isoolefins and dimers thereof by dissociation of ethers. 4,447,668, Cl. 585-639.000.

Smith, Richard R.; and Kelley, Mellis M., to Goodyear Tire & Rubber Company, The. Polyterephthalates and copolymers thereof having high clarity and process for making same. 4,447,595, Cl. 528-274.000.

Smith, Robert L.: *See—*
Gorring, Robert L.; and Smith, Robert L., 4,447,313, Cl. 208-86.000.

Smith, Teddy V. Material processing machinery. 4,446,678, Cl. 56-1.000.

Smith, Thomas J., to TII Industries Inc. Telephone surge protector and housings therefor. 4,447,848, Cl. 361-124.000.

Smith, Thomas M. Infra-red equipment and use. 4,447,205, Cl. 431-328.000.

Smith, Wallace E. Container with flexible pouring spout and sealing closure. 4,446,994, Cl. 222-475.000.

Snelling, Christopher; and Lysy, Dusan G., to Xerox Corporation. Charged particle sensor. 4,447,145, Cl. 355-14.00D.

Snow, Richard F.: *See—*
Smith, Donald C.; Snow, Richard F.; and Pauli, George B., 4,447,864, Cl. 362-311.000.

Societa Italiana Vetro - SIV - S.p.A.: *See—*
Di Nocco, Dino; and Delle Donne, Nicola, 4,447,252, Cl. 65-268.000.

Societa Italiana Vetro SIV SpA: *See—*
Kalbskopf, Reinhard; Baumberger, Otto; and Masson, Serge, 4,446,815, Cl. 118-718.000.

Societe Anonyme DBA: *See—*
Le Deit, Gerard, 4,446,947, Cl. 188-73.340.

Societe Chimique de la Grande Paroisse, Azote et Produits Chimiques: *See—*
Hamon, Christian; Bandiera, Jean; and Senes, Michel, 4,447,669, Cl. 585-640.000.

Societe d'Applications Generales d'Electricite et de Mechanique Sagem: *See—*
Barthelat, Rene; and Dore, Alain, 4,447,129, Cl. 350-302.000.

Societe d'Etude du Radant: *See—*
Chekroun, Claude D.; and Michel, Yves C., 4,447,815, Cl. 343-754.000.

Societe Nationale des Poudres et Explosifs: *See—*
Bergeret, Wilfrid; Gautier, Jean-Claude; Raynal, Serge; and Boileau, Sylvie, 4,447,584, Cl. 525-340.000.

Sofranko, John A.; and Gaffney, Anne M., to Atlantic Richfield Company. Oxidative carbonylation of alcohols to dialkyl oxalates using a heterogeneous iron promoted Pd-V-P catalyst. 4,447,639, Cl. 560-204.000.

Sofranko, John A.: *See—*
Gaffney, Anne M.; and Sofranko, John A., 4,447,638, Cl. 560-204.000.

Sollins, Irving V.: *See—*
Kaye, Gordon E.; Schwartz, Eugene B.; and Sollins, Irving V., 4,447,223, Cl. 604-61.000.

Solmat Systems, Ltd.: *See—*
Bronicki, Lucien Y.; Hershman, Haim; and Lehmann, Gerard, 4,446,700, Cl. 60-641.800.

Soma, Tsunenori, to Canon Kabushiki Kaisha. Liquid crystal driving apparatus. 4,447,131, Cl. 350-333.000.

Sommer, Rolf: *See—*
Kummermehr, Hans; and Sommer, Rolf, 4,447,345, Cl. 252-62.000.

Sommerer, Klaus, to Haendler & Natermann GmbH. Bottleneck foil. 4,447,502, Cl. 428-571.000.

Sone, Yasuo, to Fuji Xerox Co., Ltd. Sheet peeling pawl. 4,447,054, Cl. 271-311.000.

Soneda, Mitsuo; and Ohtsu, Takaji, to Sony Corporation. Liquid crystal matrix display device. 4,447,812, Cl. 340-784.000.

Sony Corporation: *See—*
Miyahra, Katsunobu; and Matsumoto, Nobuyuki, 4,447,677, Cl. 179-107.00R.
Smith, Grant M., 4,447,835, Cl. 360-10.200.
Soneda, Mitsuo; and Ohtsu, Takaji, 4,447,812, Cl. 340-784.000.
Wilkinson, James H., 4,447,902, Cl. 371-39.000.

Souder, James J., Jr.; Scarborough, Edward D., Jr.; Fox, Merlin D.; Rettich, Donald R.; and Mason, Robert L., to Positioning Devices, Inc. Spring counterbalanced support arm system. 4,447,031, Cl. 248-280.100.

Southern Pacific Transportation Company: *See—*
Empson, Kenneth G., 4,446,734, Cl. 73-586.000.

Southwire Company: *See—*
Stone, Kenneth R.; and Uppaluri, Bapa R., 4,446,712, Cl. 72-243.000.

Spacil, Jiri: *See—*
Strnadova, Karin; Kybal, Jan; Svoboda, Eduard; and Spacil, Jiri, 4,447,540, Cl. 435-254.000.

Sperry Corporation: *See—*
Deleu, Walter V., 4,446,875, Cl. 130-27.0JT.
Greaser, Randy A., 4,446,786, Cl. 100-88.000.

Spickett, Robert G. W.; Mauri, Jacinto M.; and Puchades, Jesus E. B., to Anphar S.A. Basic aluminium magnesium carbonate. 4,447,417, Cl. 424-156.000.

Spielbrink, Heinrich: *See—*
Mueller, Dieter J.; Fricke, Hermann; and Spielbrink, Heinrich, 4,447,273, Cl. 148-6.15R.

Spies, Karl-Heinrich: *See—*
Ehrmann, Peter; Fuchs, Dieter; and Spies, Karl-Heinrich, 4,447,064, Cl. 277-134.000.

Spiess, Karl-Heinz: *See—*
Simm, Manfred; Spiess, Karl-Heinz; and Weiss, Richard, 4,447,488, Cl. 428-213.000.

Spitz, Seymour J., Jr.; Mookherjee, Braja D.; Hill, Ira D.; Keleher, Lloyd F.; Trenkle, Robert W.; and Wolff, Robin K., to International Flavors & Fragrances Inc. Method of increasing extractable cedarwood oil from Juniperus Mexicana. 4,446,651, Cl. 47-10.000.

Spletzer, Eldon G.: *See—*
Chappell, Charles W.; and Spletzer, Eldon G., 4,447,373, Cl. 264-4.000.

SPOFA, spojene podniky prozdravotnickou vyrobu: *See—*
Strnadova, Karin; Kybal, Jan; Svoboda, Eduard; and Spacil, Jiri, 4,447,540, Cl. 435-254.000.

Sprague Electric Company: *See—*
Clement, Warren J., 4,447,852, Cl. 361-306.000.
Markarian, Paul M., 4,447,854, Cl. 361-329.000.

Spranger, Douglas M.: *See—*
Heinzelman, Bert D.; Spranger, Douglas M.; Brookes, Malcolm J.; and Kuphal, John E., 4,447,482, Cl. 428-42.000.

Springs Industries, Inc.: *See—*
Hendrix, James E.; and Payet, George L., 4,447,241, Cl. 8-116.400.

Sprouse, D. Leonard: *See—*
Ivey, H. Grady; and Sprouse, D. Leonard, 4,447,035, Cl. 249-194.000.

Sprow, Robert B.: *See—*
Panuska, Andrew J.; Santana, Manuel R.; and Sprow, Robert B., 4,446,686, Cl. 57-6.000.

Sprugel, Gerd: *See—*
Jennen, Wolfgang; and Sprugel, Gerd, 4,446,682, Cl. 56-119.000.

Spurlock, Robert C.; and Foster, Larry W., to MPI, Inc. Apparatus for making foam carpet pad. 4,447,382, Cl. 264-123.000.

SRI International: *See—*
Wilson, David A.; Buxton, James L.; and Green, Philip S., 4,446,740, Cl. 73-626.000.

Staal, Philip W., to Miles Laboratories, Inc. Method for the preparation of liquid aluminum citrate. 4,447,364, Cl. 260-448.00R.

Staar S: *See—*
Schatteman, Etienne A.; and d'Alayer de Costemore d'Arc, Stephane M. A., 4,447,900, Cl. 369-200.000.

Stafford, George C.; and Bradford, Donald C., to Finnigan Corporation. Ionizer including discharge ion source and method. 4,447,728, Cl. 250-423.00R.

Stahler, Gerhard; and Waltersdorfer, Anna, to Hoechst Aktiengesellschaft. 1-Alkyl-3-alkoxymethyl-4-alkoxy-5-dialkylcarbamoyloxy pyrazoles and use as aphicides. 4,447,444, Cl. 424-273.00P.

Stahlhuth, Paul H., to Ford Aerospace & Communications Corporation. Escapement device. 4,446,750, Cl. 74-1.500.

Stalberg, Nils G., to International Business Machines Corporation. Video signal detector. 4,447,774, Cl. 328-150.000.

Stalder, Heinz, to Sapal, Societe Anonyme des Plieuses Automatiques. Device and method for packing various products in boxes. 4,446,671, Cl. 53-445.000.

Stallings, George P.: *See—*
Schossow, George W.; and Stallings, George P., 4,447,844, Cl. 361-77.000.

Standard-Knapp, Inc.: *See—*
Raudat, John L., 4,446,672, Cl. 53-448.000.

Standard Oil Company, The: *See—*
McGuiggan, Michael F.; and Kuch, Philip L., 4,447,409, Cl. 423-416.000.

Standard Oil Company (Indiana): *See—*
Donohue, John A.; Knobloch, James O.; Petty-Weeks, Bruce; and Cerefice, Steven A., 4,447,645, Cl. 562-473.000.
Hagen, Gary P., 4,447,641, Cl. 560-211.000.
Keske, Robert G.; Brooks, Gary T.; and Bockrath, Ronald E., 4,447,574, Cl. 524-400.000.
Knepper, Jay C., 4,447,090, Cl. 299-2.000.
Wennerberg, Arnold N., 4,447,665, Cl. 585-379.000.

Standley, Charles L.: *See—*
Logan, Joseph S.; Mauer, John L., IV; Rothman, Laura B.; Schwartz, Geraldine C.; and Standley, Charles L., 4,447,824, Cl. 357-71.000.

State Industries, Inc.: *See—*
Denton, Donald W., 4,447,377, Cl. 264-45.200.

State of Oregon Acting by and Through the State Board of Higher Education on behalf of Portland State University: *See—*
Kasaaian, Arash S.; and Dash, John, 4,447,299, Cl. 204-43.00R.

Steigelmann, William H., to En-Save, Inc. Terraced solar energy collector. 4,446,852, Cl. 126-432.000.

Steigerwalt, Edward J.: *See*—
Woytek, Andrew J.; Lileck, John T.; and Steigerwalt, Edward J., 4,446,920, Cl. 166-297.000.
Steinbach, Robert L., to Chicago Lock Co. Cylinder lock mechanism. 4,446,709, Cl. 70-363.000.
Steiner, Gerd; Hofmann, Hans P.; Kreiskott, Horst; Teschendorf, Hans-Juergen; and Lenke, Dieter, to BASF Aktiengesellschaft. 10-Substituted 5-cyanomethylene-dibenzo[A,B]-cycloheptenes, their preparations, and therapeutic agents containing these compounds. 4,447,610, Cl. 544-381.000.
Steinkohl, Anton: *See*—
Christiansen, Uwe; Rau, Karlheinz; Steinkohl, Anton; and Streb, Bruno, 4,447,130, Cl. 350-310.000.
Stengel, Frederick H.: *See*—
Schwartz, Henry D.; Krull, Irwin H.; Clement, Carl P.; Stengel, Frederick H.; and Hayslett, David D., 4,447,398, Cl. 422-102.000.
Stephan, Hans-Werner; Klein, Hermann; and Lehr, Klaus, to Hoechst Aktiengesellschaft. Metering device. 4,447,400, Cl. 422-150.000.
Sterling Drug Inc.: *See*—
Hung, William M.; and Ehlinger, Edward E., 4,447,616, Cl. 546-335.000.
Stern, Gerhard; and Weinrotter, Klaus, to Chemie Linz AG; and Chemiefaser Lenzing AG. Flame-retardant polyacrylonitrile fiber. 4,447,568, Cl. 524-101.000.
Stevens, Colin R.; and Ababurko, Victor, to Gestetner Manufacturing Limited. Ink control for a multi-cylinder stencil duplicator. 4,446,791, Cl. 101-122.000.
Stevenson, David J.; and Domian, Robert E., to Stevenson, David J. Self-defense spray device. 4,446,990, Cl. 222-82.000.
Stevenson, Robert B.: *See*—
Johnson, Paul H.; and Stevenson, Robert B., 4,446,634, Cl. 36-29.000.
Stewart, Robert D.; and Gamble, Robert L., to Foster Wheeler Energy Corporation. Fluidized bed heat exchanger utilizing induced circulation. 4,446,629, Cl. 34-57.00A.
Stewart, Rodney A.: *See*—
Antenore, Donald E.; Schmadeke, Donald W.; and Stewart, Rodney A., 4,447,463, Cl. 426-603.000.
Stihl, Andreas: *See*—
Weiss, Hermann, 4,446,954, Cl. 192-105.0CD.
Stinnett, Regan W., to United States of America, Energy. Negative ion generator. 4,447,761, Cl. 315-111.810.
Stoffel, James C., to Xerox Corporation. Image scanning apparatus and method. 4,447,830, Cl. 358-283.000.
Stol, Israel, to Westinghouse Electric Corp. Method and apparatus for arc welding. 4,447,703, Cl. 219-136.000.
Stoll, Kurt; and Glaettli, Hans-Heinrich. Pneumatic timer. 4,447,161, Cl. 368-65.000.
Stoller, Kenneth P.: *See*—
Taff, Barry E.; and Stoller, Kenneth P., 4,447,225, Cl. 604-71.000.
Stone, Kenneth R.; and Uppaluri, Bapa R., to Southwire Company. Propped cantilevered roll stand. 4,446,712, Cl. 72-243.000.
Stone, Lawrence J.; and Wells, Richard J., to Massey-Ferguson Inc. Backlighted instrument console for a tractor. 4,447,860, Cl. 362-30.000.
Stone, Lyndon R.; and Hall, James D., to Baker International Corporation. Apparatus for counting turns when making threaded joints including an increased resolution turns counter. 4,446,745, Cl. 73-862.250.
Stottlemyre, Phillip D. Fence door latch. 4,447,081, Cl. 292-264.000.
Stover, Richard W.; Proper, Frederick T.; and Young, Steven A., to Allied Corporation. Melt pump seal with vacuum housing. 4,447,061, Cl. 277-1.000.
Stowe, Robert A.: *See*—
Murchison, Craig B.; Stowe, Robert A.; and Weiss, Richard L., 4,447,664, Cl. 585-323.000.
Stratton, Susan D.: *See*—
Kuecker, Ward A.; Stratton, Susan D.; and Cason, William C., 4,447,888, Cl. 364-900.000.
Streb, Bruno: *See*—
Christiansen, Uwe; Rau, Karlheinz; Steinkohl, Anton; and Streb, Bruno, 4,447,130, Cl. 350-310.000.
Strickland Systems, Inc.: *See*—
Ivey, H. Grady; and Sprouse, D. Leonard, 4,447,035, Cl. 249-194.000.
Strnadova, Karin; Kybal, Jan; Svoboda, Eduard; and Spacil, Jiri, to SPOFA, spojene podniky prozdravotnickou vyrobu. Microorganism strain of species *Claviceps purpurea*. 4,447,540, Cl. 435-254.000.
Strobel, Wolfgang: *See*—
Berthold, Joachim; Diedrich, Bernd; Franke, Rainer; Hartlapp, Jurgen; Schafer, Werner; and Strobel, Wolfgang, 4,447,587, Cl. 526-124.000.
Strom, Robert M.: *See*—
Kershner, Larry D.; Thompson, Leonard R.; and Strom, Robert M., 4,447,656, Cl. 568-730.000.
Stromberg-Carlson Corporation: *See*—
Elliott, George; Lenk, Pedro A.; and Shah, Jayantkumar R., 4,447,673, Cl. 179-18.0HB.
Structural Accessories, Inc.: *See*—
Galbreath, Richard N., 4,447,172, Cl. 404-68.000.
Structural Dynamics Research Corporation: *See*—
Thompson, Jack M., Jr.; and Leist, Theodore H., Jr., 4,446,742, Cl. 73-663.000.
Stubbersfield, Beryl Grace: *See*—
Stubbersfield, Edgar M.; and Shaw, Leslie V., 4,446,623, Cl. 30-229.000.
Stubbersfield, Edgar M.; and Shaw, Leslie V., to Stubbersfield, Beryl Grace. Notching tool. 4,446,623, Cl. 30-229.000.
Stumm, Wolfgang, to Institut Dr. Friedrich Forster Prufgeratebau. Apparatus for securing storage tape on a test piece during magnetographic testing. 4,447,778, Cl. 324-213.000.
Stumpf, Werner: *See*—
Madaus, Rolf; and Stumpf, Werner, 4,447,455, Cl. 424-331.000.
Stumpf, William S.; and Ludwig, Gary R., to Hauserman Ltd. Acoustical pad. 4,446,663, Cl. 52-144.000.
Stussi, Karl: *See*—
Murbach, Julius, 4,447,182, Cl. 411-45.000.
Subotic, Miroslav: *See*—
Czech, Franz; and Subotic, Miroslav, 4,447,671, Cl. 174-28.000.
Sugahara, Byron M.; Freelund, Avrum A.; and Zinger, George, to Reefer Express Lines Pty., Ltd. Deck construction for refrigerated cargo ships. 4,446,805, Cl. 114-76.000.
Sugiyama, Hiroyuki, to Victor Company of Japan, Ltd. Reproducing apparatus for reproducing a rotary recording medium recorded with a color video signal. 4,447,834, Cl. 358-310.000.
Sugiyama, Takahiro; and Hagiwara, Yukio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Objective system for video disc. 4,447,138, Cl. 350-472.000.
Sugiyama, Tomokazu, to Nihon Plast Co., Ltd. Automotive horn switch structure on steering wheel. 4,447,684, Cl. 200-61.540.
Sugizawa, Taijiro; Yoshimura, Hironori; and Toyama, Junichi, to Mitsubishi Kinzoku Kabushiki Kaisha. Blade member of cermet having surface reaction layer and process for producing same. 4,447,263, Cl. 75-233.000.
Sullivan, Michael T., to Exanno Products Limited. Duct jointing system. 4,447,079, Cl. 285-363.000.
Sumida, Seizo: *See*—
Noguchi, Hiroshi; Yoshida, Ryo; Sumida, Seizo; and Kamoshita, Katsuzo, 4,447,260, Cl. 71-118.000.
Sumitomo Chemical Company, Limited: *See*—
Noguchi, Hiroshi; Yoshida, Ryo; Sumida, Seizo; and Kamoshita, Katsuzo, 4,447,260, Cl. 71-118.000.
Sumitomo Heavy Industries, Ltd.: *See*—
Suzuki, Mitsuru; and Tomita, Yasuo, 4,446,701, Cl. 62-6.000.
Sunagawa, Masao: *See*—
Watanabe, Syuji; Ishii, Yoshitaro; and Sunagawa, Masao, 4,446,594, Cl. 15-323.000.
Sunbeam Plastics Corporation: *See*—
Gach, Peter P.; and Bush, Randall G., 4,446,979, Cl. 215-203.000.
Supraton F. J. Zucker GmbH: *See*—
Zucker, Friedrich J.; and Osthaus, Georg, 4,447,535, Cl. 435-162.000.
Sussman, Howard. Storage device for a portable hair dryer or the like. 4,446,972, Cl. 211-13.000.
Sutehall, Ralph, to International Standard Electric Corporation. Plastic sheathed cables. 4,447,122, Cl. 350-96.230.
Sutter, Franz, to Institut Straumann AG. Implant for securing a denture. 4,447,209, Cl. 433-173.000.
Sutton, Harry G., Jr., to United States of America, Energy. Bolt failure detection. 4,447,388, Cl. 376-245.000.
Suwahara, Hiroshi: *See*—
Mizuno, Takaji; Suwahara, Hiroshi; and Segawa, Hirohisa, 4,447,702, Cl. 219-130.330.
Suzer Brothers Ltd.: *See*—
Herzog, Rudolf, 4,447,869, Cl. 364-184.000.
Suzuki, Akira; Kaneko, Katumi; and Inoue, Nobuyoshi, to Copal Company Limited. Blade type focal plane shutter. 4,447,142, Cl. 354-246.000.
Suzuki, Fumio; Fujikawa, Yoshihiro; Yamamoto, Susumu; Mizutani, Hidemi; Ohya, Tunehiko; Ikai, Takashi; and Oguchi, Toshihiko, to Nissan Chemical Industries, Ltd. N-(Unsubstituted or substituted pyridyl)aminomethylene-diphosphonic acids, herbicidal compositions containing same, their use for herbicides, and process for preparing same. 4,447,256, Cl. 71-86.000.
Suzuki, Haruo; and Hashimoto, Shigeyoshi, to Nippondenso Co., Ltd. Die-casting method. 4,446,907, Cl. 164-120.000.
Suzuki, Hirokazu; and Akiyama, Takehiro, to Fujitsu Limited. Semiconductor device for driving thermal print heads. 4,447,704, Cl. 219-216.000.
Suzuki, Ikuo: *See*—
Asaeda, Toshio; Suzuki, Ikuo; Imai, Tomoyasu; and Kitajima, Masato, 4,446,657, Cl. 51-206.00R.
Suzuki, Koichi; Yoshihara, Mikio; Kawai, Shinji; and Mori, Katsuhiro, to Aisin Seiki Kabushiki Kaisha. Heated toilet seat. 4,446,584, Cl. 4-237.000.
Suzuki, Masao: *See*—
Kitamura, Yasuo; Suzuki, Masao; Kubota, Toshio; Watanabe, Hiroshi; and Tsujimoto, Masaaki, 4,446,881, Cl. 137-1.000.
Suzuki, Mikio; and Yamazaki, Masafumi, to Nissan Motor Co., Ltd. Evaporative emission control system. 4,446,838, Cl. 123-520.000.
Suzuki, Mitsuru; and Tomita, Yasuo, to Sumitomo Heavy Industries, Ltd. Fluid-operated refrigerating machine. 4,446,701, Cl. 62-6.000.
Suzuki, Shintaro; Iizuka, Sadao; and Moriya, Yoshimi, to Kanto Denka Kogyo Co., Ltd. Production of magnetic powder. 4,447,264, Cl. 75-251.000.
Suzuki, Tomosaburo; and Kato, Toshiki, to Kabushiki Kaisha Daisei Kikai. Fixed quantity feed apparatus. 4,446,992, Cl. 222-196.000.
Suzuki, Yasuo: *See*—
Tamura, Akira; and Suzuki, Yasuo, 4,446,905, Cl. 152-361.0DM.
Svoboda, Eduard: *See*—
Strnadova, Karin; Kybal, Jan; Svoboda, Eduard; and Spacil, Jiri, 4,447,540, Cl. 435-254.000.

Sweeney, David F.: *See—*
Konkel, Joseph; and Sweeney, David F., 4,446,790, Cl. 101-93.140.
Sweigart, Clyde M.: *See—*
Goldfarb, Louis; and Sweigart, Clyde M., 4,447,347, Cl. 252-70.000.
Swift, J. Nathan: *See—*
Swift, John N.; and Hawkins, Harry M., 4,447,212, Cl. 434-185.000.
Swift, John N.; and Hawkins, Harry M., to Swift, J. Nathan. Verbal response time conditioning apparatus. 4,447,212, Cl. 434-185.000.
Swihart, Terence J.; and Ziemelis, Maris J., to Dow Corning Corporation. Method of coating substrates with polydiorganosiloxanes having lower alkyl substituents to provide release coatings. 4,447,499, Cl. 428-447.000.
Swiss Aluminium Ltd.: *See—*
Hardt, Jean; and Widrig, Jakob, 4,446,942, Cl. 181-249.000.
Sybron Corporation: *See—*
Pillis, Lewis J.; and Davis, Lois T., 4,447,539, Cl. 435-253.000.
Systron-Donner: *See—*
Magorien, Vincent G., 4,447,040, Cl. 251-149.800.
Syva Company: *See—*
Monte, Alex A.; and Centofanti, Joan G., 4,447,527, Cl. 435-7.000.
Szabo, Bill: *See—*
Perl, Ludovic; and Szabo, Bill, 4,447,096, Cl. 312-111.000.
Szycher, Michael, to Thermo Electron Corporation. Extrudable polyurethane for prosthetic devices prepared from a diisocyanate, a polytetramethylene ether polyol and 1,4 butane diol. 4,447,590, Cl. 528-76.000.
Tabak, Samuel A.: *See—*
Angevine, Philip J.; Audeh, Costandi A.; Tabak, Samuel A.; and Yan, Tsoung Y., 4,447,312, Cl. 208-46.000.
Tabuchi, Kenji, to Minolta Camera Kabushiki Kaisha. Electrostatic image developing method correcting irregularities of magnetic brush developing. 4,447,518, Cl. 430-122.000.
Tack, Carl E., Jr., to Danly Machine Corporation. Hydraulic clutching and braking system for starting and stopping a power press. 4,446,785, Cl. 100-35.000.
Taco Operations, Inc.: *See—*
Bernal, Eddie L., 4,447,457, Cl. 426-91.000.
Tada, Yoshikazu, to Hayashikane Shipbuilding & Engineering Co., Ltd., a part interest. Method and apparatus for purifying contamination of dental consultation room. 4,446,861, Cl. 128-139.000.
Taff, Barry E.; and Stoller, Kenneth P. Multidose jet injector. 4,447,225, Cl. 604-71.000.
Tafuri, Michael W.; and Tao, Bernard Y., to Procter & Gamble Company, The. Structural fat and method for making same. 4,447,462, Cl. 426-601.000.
Tague, Steven A.; and Negi, Virendra S., to Honeywell Information Systems Inc. Apparatus for setting the basic clock timing in a data processing system. 4,447,870, Cl. 364-200.000.
Tai, Louis H. T., to Lever Brothers Company. Suds suppressing granules for use in detergent compositions. 4,447,349, Cl. 252-174.130.
Taig, Alistair G. Support assembly for a vehicle. 4,446,998, Cl. 224-329.000.
Takada, Juichiro. Belt transfer ring for passive vehicle occupant seat belt systems. 4,447,074, Cl. 280-804.000.
Takada, Sanae: *See—*
Ohyama, Hiroshi; Takada, Sanae; Morita, Ken; and Yamamura, Saburo, 4,447,259, Cl. 71-94.000.
Takagi, Hiroyoshi: *See—*
Toi, Mitsuharu; and Takagi, Hiroyoshi, 4,447,020, Cl. 242-198. 00.
Takagi, Shoji: *See—*
Akiyama, Toru; Kamihigoshi, Tsutomu; Takagi, Shoji; and Maeda, Tadayuki, 4,447,663, Cl. 570-150.000.
Takagi, Yasuo; and Horibe, Michiharu, to Cemedine Co., Ltd.; and Tohto Kasei Co., Ltd. Epoxy resin adhesive compositions. 4,447,579, Cl. 525-113.000.
Takagi, Yoshihiro: *See—*
Hirano, Shigeo; and Takagi, Yoshihiro, 4,447,522, Cl. 430-405.000.
Takahashi, Iwashige: *See—*
Nishikawa, Yoshinori; and Takahashi, Iwashige, 4,446,787, Cl. 100-99.000.
Takahashi, Kotei, to Nissan Motor Company, Ltd. Air breather device of an automotive manual transmission. 4,446,755, Cl. 74-606.00R.
Takahashi, Yoshihiro; Okuyama, Katsuo; and Matsukuma, Yutaka, to Fujitsu Limited. Shelf unit for electronic communication devices. 4,447,856, Cl. 361-383.000.
Takashima, Toshiharu: *See—*
Ochiai, Yoshiki; Nomura, Kenji; Yamakage, Tetsuro; and Takashima, Toshiharu, 4,447,177, Cl. 408-161.000.
Takasugi, Hisashi: *See—*
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,447,430, Cl. 424-246.000.
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds. 4,447,430, Cl. 424-246.000.
Takemae, Yoshihiro; Enomoto, Seiji; Nozaki, Shigeki; Mezawa, Tsutomu; and Kabashima, Katsuhiko, to Fujitsu Limited. Buffer circuit including a current lead circuit for maintaining the charged voltages. 4,447,745, Cl. 307-269.000.
Takeo, Kimihiko; Hirano, Tooichiro; and Sato, Fumihiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Processed starch, process for preparing same and use of same in medicines. 4,447,601, Cl. 536-102.000.
Takeuchi, Takahito: *See—*
Furuya, Koutaro; Hosoda, Kazuho; Takeuchi, Takahito; Ishikura, Yasuyuki; and Kameda, Morihiro, 4,446,580, Cl. 3-6.000.
Takezaki, Jiro: *See—*
Kimura, Katsuhiro; Endo, Akira; and Takezaki, Jiro, 4,446,826, Cl. 123-143.00B.
Takigawa, Shinichiro: *See—*
Hoshiyama, Satoshi; Muto, Hiroyuki; Shinke, Shuzo; Otsuka, Kanji; Takigawa, Shinichiro; and Yamazaki, Hiroyuki, 4,447,661, Cl. 568-882.000.
Takimoto, Hiroyuki: *See—*
Hirata, Noritsugu; Takimoto, Hiroyuki; and Maeda, Masaya, 4,447,837, Cl. 360-33.100.
Takushima, Takashi: *See—*
Fujita, Shozo; Futatsuishi, Shunichi; and Takushima, Takashi, 4,446,643, Cl. 40-590.000.
Talley, Lloyd A., to Eubanks Engineering Company. Apparatus for attaching terminals to the ends of electric conductors. 4,446,615, Cl. 29-742.000.
Tamura, Akira; and Suzuki, Yasuo, to Bridgestone Tire Company Limited. Radial tires for running on rough ground. 4,446,905, Cl. 152-361.0DM.
Tamura, Hitoshi; and Shigeoka, Katsuhei, to Mitsubishi Rayon Co., Ltd. Process for producing antipilling acrylic synthetic fiber. 4,447,384, Cl. 264-206.000.
Tanaka, Akira, to Tokyo Metropolitan Institute of Medical Science, The. Preparing replica film of specimen for electron microscopy. 4,447,374, Cl. 264-22.000.
Tanaka, Masaaki: *See—*
Sekiguchi, Kiyonori; Igashira, Toshihiko; Tanaka, Takeshi; Kawai, Hisasi; Yamada, Mitsumasa; Kawagoe, Michio; and Tanaka, Masaaki, 4,446,839, Cl. 123-569.000.
Tanaka, Minoru: *See—*
Terahara, Akira; and Tanaka, Minoru, 4,447,626, Cl. 549-292.000.
Tanaka, Takeshi: *See—*
Sekiguchi, Kiyonori; Igashira, Toshihiko; Tanaka, Takeshi; Kawai, Hisasi; Yamada, Mitsumasa; Kawagoe, Michio; and Tanaka, Masaaki, 4,446,839, Cl. 123-569.000.
Tanemura, Mitsura; Yamazaki, Tamotsu; Mizuno, Koji; Kaiho, Shinichi; Kakimoto, Morio; Hoshino, Eiichi; Matsunaga, Isao; and Hata, Shun-ichi, to Chugai Seiyaku Kabushiki Kaisha. Anti-peptic ulcer agent. 4,447,453, Cl. 424-319.000.
Tango, Hiroyuki: *See—*
Maeguchi, Kenji; and Tango, Hiroyuki, 4,447,823, Cl. 357-23.000.
Tani, Hoshiro: *See—*
Ushio, Tetsuji; Tatsuguchi, Satoru; Otani, Toshihisa; Tani, Hoshiro; and Yabe, Tetsuo, 4,447,306, Cl. 204-224.00R.
Tanikawa, Kowji, to Olympus Optical Co., Ltd. Leap year compensation circuit. 4,447,160, Cl. 368-34.000.
Tao, Bernard Y.: *See—*
Tafuri, Michael W.; and Tao, Bernard Y., 4,447,462, Cl. 426-601.000.
Tappan Company, The: *See—*
McFarland, Robert H., 4,446,849, Cl. 126-299.00R.
Tatsuguchi, Satoru: *See—*
Ushio, Tetsuji; Tatsuguchi, Satoru; Otani, Toshihisa; Tani, Hoshiro; and Yabe, Tetsuo, 4,447,306, Cl. 204-224.00R.
Taylor, Andrew W.; and Adams, Richard G., to Beecham Group p.l.c. Penicillins and compositions containing them. 4,447,422, Cl. 424-229.000.
Taylor, Chandler R., Jr., to A. H. Robins Company, Inc. Aryl substituted pyrido[1,4]benzodiazepines. 4,447,361, Cl. 260-244.400.
Taylor, Julian S.: *See—*
Taylor, Wesley L.; and Taylor, Julian S., 4,446,886, Cl. 137-516.290.
Taylor, Rupert M.: *See—*
Robinson, David S.; and Taylor, Rupert M., 4,447,185, Cl. 414-420.000.
Taylor, Wesley L.; and Taylor, Julian S. Safety relief valve soft seat. 4,446,886, Cl. 137-516.290.
TDK Kabushiki Kaisha: *See—*
Masujima, Sho; Shibuya, Masahide; Shoichi, Iwaya; Umeda, Kenichi; Oikawa, Yasunobu; Abe, Hisao; Midori, Yoshifumi; Fujiwara, Shinobu; and Kikuchi, Nobuaki, 4,447,549, Cl. 501-138.000.
Teccor Electronics, Inc.: *See—*
Harwell, Jack B., 4,447,849, Cl. 361-152.000.
Technicon Instruments Corporation: *See—*
Farrell, Gregory A.; and Epstein, Edward A., 4,447,883, Cl. 364-555.000.
Tegtmeier, Sheldon D., to Tegtmeier & Sons, Inc. Safety latch for extensible lift mechanisms. 4,447,089, Cl. 298-11.000.
Tegtmeier & Sons, Inc.: *See—*
Tegtmeier, Sheldon D., 4,447,089, Cl. 298-11.000.
Teijin Limited: *See—*
Funakoshi, Wataru; and Urasaki, Takanori, 4,447,593, Cl. 528-176.000.
Tektronix, Inc.: *See—*
Crosby, Philip S.; and Jordan, Dale A., 4,447,803, Cl. 340-347.0CC.
Moore, Wayne A., 4,447,876, Cl. 364-200.000.
Telelogic, Inc.: *See—*
Harris, William J.; Jackson, Joseph M.; and Petty, David C., 4,447,676, Cl. 179-90.0BD.
Telex Communications, Inc.: *See—*
Flygstad, Dean W.; and Wehrmacher, Bill H., 4,447,836, Cl. 360-15.000.
Temkin, Henryk: *See—*
Chin, Aland K.; DiGiuseppe, Michael A.; and Temkin, Henryk, 4,447,822, Cl. 357-17.000.

Terada, Matsuaki; and Yokota, Koji, to Hitachi, Ltd. Data communication system with a front-end-processor. 4,447,871, Cl. 364-200.000.
Terahara, Akira; and Tanaka, Minoru, to Sankyo Company Limited. ML-236B Derivatives. 4,447,626, Cl. 549-292.000.
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, to Fujisawa Pharmaceutical Co., Ltd. 7-[2-Alkoxyimino-2-(5-amino-1,2,4-thiadiazol-3-yl)acetamido]-3-cephems. 4,447,429, Cl. 424-246.000.
Teranishi, Roy; Murphy, Edwin L.; Balser, Donald S.; and Howard, Walter E., to United States of America, Agriculture. Bait post. 4,446,648, Cl. 43-131.000.
Terasawa, Koji, to Canon Kabushiki Kaisha. Ink supplying mechanism. 4,447,820, Cl. 346-140.00R.
Terui, Nobuhiko, to Nippon Kogaku K.K. Motor control device. 4,447,768, Cl. 318-293.000.
Teschendorf, Hans-Juergen: *See—*
Steiner, Gerd; Hofmann, Hans P.; Kreiskott, Horst; Teschendorf, Hans-Juergen; and Lenke, Dieter, 4,447,610, Cl. 544-381.000.
Tetsudo Kizai Kogyo Company Limited: *See—*
Matsuo, Yoshio, 4,447,006, Cl. 238-341.000.
Teuber, Michael: *See—*
Moebus, Otto; Teuber, Michael; and Reuter, Helmut, 4,447,534, Cl. 435-161.000.
Teutsch, Jean G.; Costerousse, Germain; Philibert, Daniel; and Deraedt, Roger, to Roussel Uclaf. Steroid derivatives. 4,447,424, Cl. 424-238.000.
Texas Instruments Incorporated: *See—*
Brantingham, George L.; Lou, Perry W.; Housey, Lawrence J.; Tubbs, Graham S.; and Teza, Jeffrey R., 4,447,881, Cl. 364-488.000.
Culley, Bobby G., 4,447,213, Cl. 434-201.000.
Schulte, Eric, 4,447,291, Cl. 156-643.000.
Wagers, Robert S., 4,447,754, Cl. 310-313.00R.
Weirauch, Donald F., 4,447,393, Cl. 420-590.000.
Teza, Jeffrey R.: *See—*
Brantingham, George L.; Lou, Perry W.; Housey, Lawrence J.; Tubbs, Graham S.; and Teza, Jeffrey R., 4,447,881, Cl. 364-488.000.
Th.Goldschmidt AG: *See—*
Fink, Hans-Ferdi; Koerner, Gotz; and Luksch, Edmund, 4,447,498, Cl. 428-447.000.
Thatchcode Limited T/A Flexiform: *See—*
Parker, Ray, 4,447,098, Cl. 312-216.000.
Thermo Electron Corporation: *See—*
Szycher, Michael, 4,447,590, Cl. 528-76.000.
Thomas, Brian H.: *See—*
Imerman, Curtis E.; Langerud, David S.; and Thomas, Brian H., 4,446,976, Cl. 212-189.000.
Thomas, Perry W. Lawnmower powered implement. 4,446,679, Cl. 56-2.000.
Thompson, Jack M., Jr.; and Leist, Theodore H., Jr., to Structural Dynamics Research Corporation. Motion transmission limiting apparatus. 4,446,742, Cl. 73-663.000.
Thompson, Kenneth W. Self-contained fluid dispenser. 4,446,991, Cl. 222-94.000.
Thompson, Leonard R.: *See—*
Kershner, Larry D.; Thompson, Leonard R.; and Strom, Robert M., 4,447,656, Cl. 568-730.000.
Thompson, Marlin H.: *See—*
Howlett, James F.; and Thompson, Marlin H., 4,447,750, Cl. 310-89.000.
Thompson, Thomas C.: *See—*
Gula, John A.; Brady, John D.; Thompson, Thomas C.; and Alt, Joyce M., 4,447,230, Cl. 604-122.000.
Thomson-CSF: *See—*
Lefebure, Jean M., 4,447,810, Cl. 340-756.000.
Thorne, James M.: *See—*
Jensen, Reed J.; Thorne, James M.; Cluff, Coran L.; and Hayes, John K., 4,447,303, Cl. 204-157.10R.
Thornhill, John: *See—*
Kurina, Miles J.; and Thornhill, John, 4,447,816, Cl. 343-877.000.
Thorud, Stanley R.: *See—*
Miller, LeRoy; Thorud, Stanley R.; and Rivkin, Eric M., 4,446,660, Cl. 52-36.000.
Tiers, George V. D.; Aasen, Steven M.; Dalzell, Rex J.; and Holmes, Brian N., to Minnesota Mining and Manufacturing Company. Fixing of tetra(hydrocarbyl)borate salt imaging systems. 4,447,521, Cl. 430-337.000.
TII Industries Inc.: *See—*
Smith, Thomas J., 4,447,848, Cl. 361-124.000.
Tile Council of America, Inc.: *See—*
Chesney, Joseph J., Jr.; and Broney, Scott C., 4,447,267, Cl. 106-93.000.
Tima, Zdenek: *See—*
Jaumann, Leonhard; Tima, Zdenek; and Feierlein, Heinz, 4,447,033, Cl. 248-563.000.
Tindel, Thomas F.: *See—*
Winiecki, Tadeus; and Tindel, Thomas F., 4,447,069, Cl. 280-270.000.
Tioxide Group PLC: *See—*
Howard, Peter B.; and O'Donnell, Derek, 4,447,270, Cl. 106-300.000.
Howard, Peter B.; and O'Donnell, Derek, 4,447,271, Cl. 106-300.000.
Tipping, James W.: *See—*
Bradbury, John A.; Rowlands, Reuben; and Tipping, James W., 4,447,491, Cl. 428-304.400.
Todd, David B.: *See—*
Karian, Harutun G.; and Todd, David B., 4,447,383, Cl. 264-8.000.
Todd, John C. Method and apparatus for producing viscous or waxy crude oils. 4,446,917, Cl. 166-59.000.
Tohto Kasei Co., Ltd.: *See—*
Takagi, Yasuo; and Horibe, Michiharu, 4,447,579, Cl. 525-113.000.
Toi, Mitsuharu; and Takagi, Hiroyoshi, to Hitachi Maxell, Ltd. Magnetic recording tape cartridge. 4,447,020, Cl. 242-198.000.
Tojza, Roman A., to Bally Manufacturing Corporation. Game gate device. 4,447,058, Cl. 273-121.00A.
Tokico Ltd.: *See—*
Kato, Tetsuo, 4,446,895, Cl. 141-4.000.
Tokorozawa, Sadao, to Pilot Man-Nen-Hitsu Kabushiki Kaisha. Apparatus for dispensing a preselected amount of liquid. 4,446,993, Cl. 222-214.000.
Tokura, Isao: *See—*
Ueda, Sadao; Tokura, Isao; and Yamada, Mitsuhiko, 4,447,113, Cl. 358-75.000.
Tokyo Electric Co., Ltd.: *See—*
Ochiai, Kuniaki; Horii, Masami; and Norigoe, Takashi, 4,447,166, Cl. 400-124.000.
Tokyo Metropolitan Institute of Medical Science, The: *See—*
Tanaka, Akira, 4,447,374, Cl. 264-22.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Asano, Masamichi; and Iwahashi, Hiroshi, 4,447,895, Cl. 365-226.000.
Kohmoto, Kohtaro; Ebara, Hiroyuki; and Nira, Hisami, 4,447,756, Cl. 313-487.000.
Maeguchi, Kenji; and Tango, Hiroyuki, 4,447,823, Cl. 357-23.000.
Moriwaki, Takeshi, 4,447,216, Cl. 445-70.000.
Oana, Yasuhisa; Yasuda, Nobuaki; Yamashita, Masato; and Ozawa, Norio, 4,447,825, Cl. 357-71.000.
Oguchi, Toshihiko; Kato, Hirohisa; and Yokoyama, Hirotaka, 4,447,467, Cl. 427-48.000.
Watanabe, Masaru; Matsumura, Satoru; Amada, Takayoshi; Irie, Hiromitsu; and Saito, Norihisa, 4,447,293, Cl. 159-6.200.
Yoshihisa, Kozo, 4,447,901, Cl. 370-74.000.
Tollefson, Mark S.: *See—*
Schultz, Charles R.; Tollefson, Mark S.; and Wuertz, Howard A., 4,447,173, Cl. 405-181.000.
Tomasovic, Beth: *See—*
Anouchi, Abraham Y.; Novack, Robert L.; and Tomasovic, Beth, 4,447,397, Cl. 422-94.000.
Tomita, Yasuo: *See—*
Suzuki, Mitsuru; and Tomita, Yasuo, 4,446,701, Cl. 62-6.000.
Tomka, Jiri G.: *See—*
Cogswell, Frederic N.; and Tomka, Jiri G., 4,447,599, Cl. 528-502.000.
Tomuro, Noboru; Ishiguchi, Isao; Tsujikawa, Shinjiro; Kashima, Masao; and Miyashita, Yasuo, to Mitsubishi Mining & Cement Company, Ltd. Ceramic capacitor. 4,447,853, Cl. 361-321.000.
Toray Silicone Company, Ltd.: *See—*
Fukayama, Miyoji; and Ichiijo, Chikara, 4,447,576, Cl. 524-714.000.
Toshiba Kikai Kabushiki Kaisha: *See—*
Kawakami, Toshio; and Kimura, Izumi, 4,446,612, Cl. 29-568.000.
Toshio Asaeda: *See—*
Asaeda, Toshio; Suzuki, Ikuo; Imai, Tomoyasu; and Kitajima, Masato, 4,446,657, Cl. 51-206.00R.
Toumani, Rouben: *See—*
Arntsen, Tom D.; and Toumani, Rouben, 4,447,675, Cl. 179-84.00R.
Toyama, Junichi: *See—*
Sugizawa, Taijiro; Yoshimura, Hironori; and Toyama, Junichi, 4,447,263, Cl. 75-233.000.
Toyo Engineering Corporation: *See—*
Kitamura, Yasuo; Suzuki, Masao; Kubota, Toshio; Watanabe, Hiroshi; and Tsujimoto, Masaaki, 4,446,881, Cl. 137-1.000.
Toyo Rubber Industry Co. Ltd., The: *See—*
Kishida, Katsuji; Oonishi, Masakazu; and Oda, Keijiro, 4,446,904, Cl. 152-356.00R.
Toyoda Gosei: *See—*
Katagiri, Masayoshi; Kondo, Toshio; and Midooka, Masanori, 4,447,066, Cl. 277-212.0FB.
Toyoda Koki Kabushiki Kaisha: *See—*
Asaeda, Toshio; Suzuki, Ikuo; Imai, Tomoyasu; and Kitajima, Masato, 4,446,657, Cl. 51-206.00R.
Ochiai, Yoshiki; Nomura, Kenji; Yamakage, Tetsuro; and Takashima, Toshiharu, 4,447,177, Cl. 408-161.000.
Toyoshima, Satoshi: *See—*
Ogura, Haruo; Furuhata, Kimio; Osawa, Toshiaki; Toyoshima, Satoshi; Shitori, Yoshiyasu; and Ito, Masayoshi, 4,447,600, Cl. 536-23.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Bessho, Hironori, 4,446,823, Cl. 123-52.0MB.
Katagiri, Masayoshi; Kondo, Toshio; and Midooka, Masanori, 4,447,066, Cl. 277-212.0FB.
Sekiguchi, Kiyonori; Igashira, Toshihiko; Tanaka, Takeshi; Kawai, Hisasi; Yamada, Mitsumasa; Kawagoe, Michio; and Tanaka, Masaaki, 4,446,839, Cl. 123-569.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Inukai, Mitsuo, 4,447,017, Cl. 242-107.40A.
Trane Company, The: *See—*
Krocker, Robert E., 4,446,913, Cl. 165-12.000.
Welch, Donald C.; and Yoerg, Christopher P., 4,446,915, Cl. 165-144.000.

Transat Corp.: *See*—
Rutkoski, John P., 4,447,782, Cl. 324-56.000.
Transnuklear GmbH: *See*—
Botzem, Werner; Knappe, Ortwin; and Laug, Reiner, 4,447,730, Cl. 250-506.100.
Traxler, James T., to Velsicol Chemical Corporation. Fluorenone esters of phosphoric and phosphonic acids as insecticides. 4,447,420, Cl. 424-210.000.
TRE Corporation: *See*—
Mullich, Richard O.; and Dushane, Ray, 4,446,707, Cl. 70-134.000.
Treise, Jan E., to Rockwell International Corporation. Digital VOR bearing measurement apparatus. 4,447,814, Cl. 343-401.000.
Trenkle, Robert W.: *See*—
Spitz, Seymour J., Jr.; Mookherjee, Braja D.; Hill, Ira D.; Keleher, Lloyd F.; Trenkle, Robert W.; and Wolff, Robin K., 4,446,651, Cl. 47-10.000.
Trescher, Viktor: *See*—
Werner, Friedrich; Mannes, Karl; and Trescher, Viktor, 4,447,647, Cl. 564-412.000.
Tresner, Homer D.: *See*—
Liu, Chao-Min; Tresner, Homer D.; and Westley, John, 4,447,533, Cl. 435-119.000.
Trezeguet, Jean-Pierre: *See*—
Guazzo, Lucien; and Trezeguet, Jean-Pierre, 4,447,115, Cl. 350-96.200.
Trimed, Inc.: *See*—
Knodle, Daniel W., 4,446,869, Cl. 128-716.000.
TRP Energy Sensors, Inc.: *See*—
Berndt, Dieter R., 4,447,164, Cl. 374-162.000.
Trudeau, William H.; Gaines, Donald R.; and Smallegan, Jon M., to O & S Manufacturing Company. Prelubricated sealed bearings. 4,447,094, Cl. 308-2.00R.
Trummlitz, Guster; Engel, Wolfhard; Eberlein, Wolfgang; Schmidt, Gunther; Hammer, Rudolf; and del Soldato, Piero, to Dr. Karl Thomae GmbH. Substituted dibenzodiazepinones. 4,447,434, Cl. 424-256.000.
Trumpy, David K.: *See*—
Giardini, Dante S.; Iwanski, Richard V.; and Trumpy, David K., 4,446,825, Cl. 123-90.650.
Trutzschler GmbH & Co. KG: *See*—
Marx, Hans-Jurgen; and Hosel, Fritz P., 4,446,602, Cl. 19-0.210.
Tsai, Nan-Hsiung: *See*—
Beinglass, Israel; and Tsai, Nan-Hsiung, 4,446,613, Cl. 29-571.000.
Tsai, Shan-Pu: *See*—
Hruska, Louis W.; and Tsai, Shan-Pu, 4,447,566, Cl. 523-221.000.
Tsuji, Kiyoshi: *See*—
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,447,430, Cl. 424-246.000.
Tsujikawa, Shinjiro: *See*—
Tomuro, Noboru; Ishiguchi, Isao; Tsujikawa, Shinjiro; Kashima, Masao; and Miyashita, Yasuo, 4,447,853, Cl. 361-321.000.
Tsujimoto, Masaaki: *See*—
Kitamura, Yasuo; Suzuki, Masao; Kubota, Toshio; Watanabe, Hiroshi; and Tsujimoto, Masaaki, 4,446,881, Cl. 137-1.000.
Tsukada, Nobuo; and Nishida, Isamu, to Seiko Instruments & Electronics Ltd. Stem mechanism for a watch. 4,447,163, Cl. 368-319.000.
Tsurumoto, Kazuo; and Ozaki, Yoshio, to Mitsubishi Denki Kabushiki Kaisha. Power supply unit for electric discharge machine. 4,447,713, Cl. 219-69.00G.
Tsuruta, Naohiro: *See*—
Ai, Hideo; and Tsuruta, Naohiro, 4,447,580, Cl. 525-121.000.
Tubbs, Graham S.: *See*—
Brantingham, George L.; Lou, Perry W.; Housey, Lawrence J.; Tubbs, Graham S.; and Teza, Jeffrey R., 4,447,881, Cl. 364-483.000.
Tuckey, Charles H., to Walbro Corporation. Self-contained rotary fuel pump. 4,447,192, Cl. 417-360.000.
Turnbull, Fred G., to General Electric Company. Regenerative rectifier circuit. 4,447,868, Cl. 363-81.000.
Tyhach, Richard J.: *See*—
Greenquist, Alfred C.; Rupchock, Patricia A.; Tyhach, Richard J.; and Walter, Bert, 4,447,529, Cl. 435-7.000.
Rupchock, Patricia A.; and Tyhach, Richard J., 4,447,526, Cl. 435-7.000.
Tyler, Derek E.: *See*—
Yarwood, John C.; Ungarean, Gary L.; Kindlmann, Peter J.; and Tyler, Derek E., 4,446,909, Cl. 164-453.000.
Tyler, Frank S., to Lever Brothers Company. Reinforced nestable containers. 4,446,969, Cl. 206-519.000.
Tyszkiewicz, Theodore J.: *See*—
Boden, Richard M.; Licciardello, Michael; and Tyszkiewicz, Theodore J., 4,447,365, Cl. 260-463.000.
Uddeholms Aktiebolag: *See*—
Bruce, Lars M., 4,447,389, Cl. 419-6.000.
Ueda, Iwao, to Hamana Iron Work Co., Ltd. Double twisting machine. 4,446,688, Cl. 57-58.650.
Ueda, Sadao; Tokura, Isao; and Yamada, Mitsuhiko, to Dainippon Screen Seizo Kabushiki Kaisha. Setup condition recorder for a color scanner. 4,447,113, Cl. 358-75.000.
Uede, Hisashi: *See*—
Kawaguchi, Masashi; Ishii, Toshiaki; Isaka, Kinichi; and Uede, Hisashi, 4,447,757, Cl. 313-509.000.
Umeda, Kenichi: *See*—
Masujima, Sho; Shibuya, Masahide; Shoichi, Iwaya; Umeda, Kenichi; Oikawa, Yasunobu; Abe, Hisao; Midori, Yoshifumi; Fujiwara, Shinobu; and Kikuchi, Nobuaki, 4,447,549, Cl. 501-138.000.
Underwood, Gene E. Fluid mixing system with inductor cleanout. 4,447,157, Cl. 366-137.000.
Ungarean, Gary L.; and Yarwood, John C., to Olin Corporation. Infrared imaging for electromagnetic casting. 4,446,908, Cl. 164-452.000.
Ungarean, Gary L.: *See*—
Yarwood, John C.; Ungarean, Gary L.; Kindlmann, Peter J.; and Tyler, Derek E., 4,446,909, Cl. 164-453.000.
Ungerboeck, Gottfried: *See*—
Chevillat, Pierre R.; and Ungerboeck, Gottfried, 4,447,908, Cl. 375-42.000.
Unimation, Inc.: *See*—
Dunne, Maurice J.; and Nielsen, Klaus W., 4,447,697, Cl. 219-86.410.
Union Carbide Corporation: *See*—
Blakeslee, Theodore R., III; and Wu, Randall, 4,447,387, Cl. 264-566.000.
Lustig, Stanley; Schuetz, Jeffrey M.; and Vicik, Stephen J., 4,447,480, Cl. 428-35.000.
Mallon, Charles B., 4,447,632, Cl. 556-470.000.
Wegman, Richard W., 4,447,648, Cl. 568-484.000.
Union Oil Company of California: *See*—
Miller, J. Wayne; and Simpson, Howard D., 4,447,317, Cl. 208-216.00R.
Young, Donald C., 4,447,253, Cl. 71-28.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Social Services in Her Britannic Majesty's Government of the: *See*—
Sinclair, Ian, 4,446,720, Cl. 73-23.000.
United States of America
Agriculture: *See*—
Gunderson, Dennis E., 4,446,743, Cl. 73-822.000.
Hasegawa, Shin, 4,447,456, Cl. 426-51.000.
Teranishi, Roy; Murphy, Edwin L.; Balser, Donald S.; and Howard, Walter E., 4,446,648, Cl. 43-131.000.
Air Force: *See*—
Marcus, Stephen; and Quist, Theodore M., 4,447,149, Cl. 356-5.000.
Army: *See*—
Bruce, Charles W.; and Brewer, Ralph J., 4,446,721, Cl. 73-29.000.
Englar, Donald G.; and Altman, Robert G., 4,447,395, Cl. 422-68.000.
Klayman, Daniel L.; Scovill, John P.; Bartosevich, Joseph F.; Mason, Carl J.; and Griffin, T. Scott, 4,447,427, Cl. 424-244.000.
Energy: *See*—
Bean, Vern E.; and Long, Frederick G., 4,447,743, Cl. 307-118.000.
Brown, Clyde O., 4,447,701, Cl. 219-121.0LG.
Cremers, David A.; and Keller, Richard A., 4,447,153, Cl. 356-361.000.
Jensen, Reed J.; Thorne, James M.; Cluff, Coran L.; and Hayes, John K., 4,447,303, Cl. 204-157.10R.
Leung, Ka-Ngo; and Ehlers, Kenneth W., 4,447,732, Cl. 250-427.000.
Lula, James W.; and Schicker, James R., 4,447,565, Cl. 523-219.000.
Maskalick, Nicholas J., 4,447,509, Cl. 429-235.000.
McLellan, Edward J.; and Webb, John A., 4,447,151, Cl. 356-218.000.
Pence, Dallas T.; and Chou, Chun-Chao, 4,447,353, Cl. 252-630.000.
Schmid, Frederick L., 4,447,085, Cl. 294-97.000.
Sefko, John; and Pavlik, Norman M., 4,447,795, Cl. 336-178.000.
Shang, Jer-Yu; Notestein, John E.; Mei, Joseph S.; and Zeng, Li-Wen, 4,447,297, Cl. 202-99.000.
Shen, Sin-Yan, 4,447,301, Cl. 204-67.000.
Stinnett, Regan W., 4,447,761, Cl. 315-111.810.
Sutton, Harry G., Jr., 4,447,388, Cl. 376-245.000.
Health and Human Services: *See*—
Yunker, Conrad E.; Cory, John C.; and Meibos, Harold R., 4,447,537, Cl. 435-235.000.
National Aeronautics and Space Administration: *See*—
Dunn, Stanley A.; Pomplun, Alan R.; Paquette, Elmer G.; Ethridge, Edwin C.; and Johnson, Jerry. L., 4,447,251, Cl. 65-142.000.
La Fever, Alan E., 4,446,757, Cl. 74-758.000.
Navy: *See*—
Allen, John H., 4,447,804, Cl. 340-347.0DD.
Bobb, Lloyd C., 4,447,117, Cl. 350-96.150.
Brown, Robert E., 4,447,776, Cl. 324-253.000.
Campana, Jerry M.; and Day, Richard B., 4,447,083, Cl. 294-66.00R.
Christe, Karl O.; and Wilson, William W., 4,447,407, Cl. 423-262.000.
Hamid, Michael, 4,447,811, Cl. 343-783.000.
Nowell, Larry H.; and Halley, Robert, 4,446,624, Cl. 33-1.00C.
Renfro, Vernon E.; Gudgeon, Ronald L.; Clelland, John P.; and Cole, Clyde C., 4,447,186, Cl. 414-589.000.
Saks, Nelson S., 4,447,272, Cl. 148-1.500.
U.S. Philips Corporation: *See*—
Coursant, Roger-Henri, 4,446,739, Cl. 73-609.000.
de Zwart, Maarten, 4,447,132, Cl. 350-346.000.

Euteneuer, Edmund; and Eckhardt, Friedhelm, 4,447,167, Cl. 400-625.000.
Hottier, Francois, 4,446,737, Cl. 73-602.000.
Mignolet, Georges M. A.; and Mestdagh, Gilbert E., 4,447,840, Cl. 360-137.000.
Moerkens, Jozef C.; and Verhees, Leonardus G. J., 4,447,759, Cl. 315-60.000.
Schayes, Raymond G. G.; Gustin, Pol A. G. J.; Bodart, Robert; and Berck, Michel F. D. J., 4,447,829, Cl. 358-260.000.
United Technologies Corporation: *See*—
Luczak, Francis J.; and Landsman, Douglas A., 4,447,506, Cl. 429-44.000.
Wiley, Walter H.; and Madden, William M., 4,447,009, Cl. 239-265.390.
University of Calif., The Regents of the: *See*—
Jacobs, Robert S.; and Faulkner, D. John, 4,447,445, Cl. 424-279.000.
University of California, Regents of the: *See*—
Goodman, Howard M.; Shine, John; and Seeburg, Peter H., 4,447,538, Cl. 435-253.000.
University of Delaware: *See*—
Langdon, Christopher J., 4,447,411, Cl. 424-14.000.
University Patents, Inc.: *See*—
Allen, Robert H.; and Seligman, Paul A., 4,447,547, Cl. 436-543.000.
Uno, Akira; Noda, Touru; and Ninohira, Akira, to Mitsubishi Paper Mills, Ltd. Process for preparing polyolefin resin-coated paper for photographic use. 4,447,524, Cl. 430-538.000.
Unterhoffer, Peter P.; and Dufresne, Gilles L., to Northern Telecom Limited. Weatherproof double door structure, and an enclosure embodying such structure. 4,446,655, Cl. 49-368.000.
UOP Inc.: *See*—
Broughton, Donald B., 4,447,329, Cl. 210-673.000.
Chao, Tai-Hsiang, 4,447,351, Cl. 252-313.00R.
Firth, Bruce E.; and Rosen, Terry J., 4,447,657, Cl. 568-783.000.
Hayes, John C.; and Castillo, Carmen, 4,447,552, Cl. 502-41.000.
Kurek, Paul R., 4,447,652, Cl. 568-658.000.
Lamb, Paul R.; Bakas, Steve T.; and Wood, Brian M., 4,447,315, Cl. 208-99.000.
O'Hara, Mark J.; and Johnson, Russell W., 4,447,556, Cl. 502-74.000.
Vora, Bipin V., 4,447,653, Cl. 568-697.000.
Upjohn Company, The: *See*—
Johnson, Roy A., 4,447,607, Cl. 544-246.000.
Lednicer, Daniel, 4,447,454, Cl. 424-330.000.
Marshall, Norman B., 4,447,449, Cl. 424-304.000.
Sih, John C.; and Lin, Chiu-Hong, 4,447,620, Cl. 548-336.000.
Upjohn Manufacturing Company M, The: *See*—
Mueller, Jerry C., 4,447,451, Cl. 424-317.000.
Uppaluri, Bapa R.: *See*—
Stone, Kenneth R.; and Uppaluri, Bapa R., 4,446,712, Cl. 72-243.000.
Uranit Uran-Isotopentrennungs-Gesellschaft mbH: *See*—
Mundt, Johann; Kasper, Horst; and Pritsch, Eckhard, 4,447,788, Cl. 318-799.000.
Urano, Shigeru: *See*—
Hiraoka, Takeshi; Urano, Shigeru; and Yamamoto, Kiyoshi, 4,447,275, Cl. 148-152.000.
Urasaki, Takanori: *See*—
Funakoshi, Wataru; and Urasaki, Takanori, 4,447,593, Cl. 528-176.000.
Ushio, Tetsuji; Tatsuguchi, Satoru; Otani, Toshihisa; Tani, Hoshiro; and Yabe, Tetsuo, to Mishima Kosan Corporation. Plating apparatus. 4,447,306, Cl. 204-224.00R.
Ushiyama, Junji. Device and method for detecting apical constriction in root canal of tooth. 4,447,206, Cl. 433-27.000.
V. Kann Rasmussen Holding A/S: *See*—
Dantzer-Sorensen, Bendt; and Christensen, Per B., 4,446,597, Cl. 16-364.000.
Vachon, Bertrand, to Ber-Vac Inc. Soil cultivating machine. 4,446,925, Cl. 172-142.000.
Vaguine, Victor A., to Clini-Therm Corporation. Microwave applicator with discoupled input coupling and frequency tuning functions. 4,446,874, Cl. 128-804.000.
Vale Industries, Inc.: *See*—
Valente, Raymond L., 4,446,711, Cl. 72-213.000.
Valente, Raymond L., to Vale Industries, Inc. U-Bolt bender. 4,446,711, Cl. 72-213.000.
Valerio, Savorgnan; and Dino, Mio. Process and equipment for veneer press to glue a thin layer on a variously shaped panel surface. 4,447,282, Cl. 156-285.000.
Vallarino, Angelo; and Vittore, Lorenzo, to Minnesota Mining and Manufacturing Company. Process for providing a matt surface on a photographic material and photographic material provided with such matt surface. 4,447,525, Cl. 430-539.000.
Vanderpool, Clarence D.; and MacInnis, Martin B., to GTE Products Corporation. Recovery of molybdenum from molybdenum disulfide. 4,447,404, Cl. 423-61.000.
Vandersall, Howard L., to Monsanto Company. Stabilized galactomannan gum compositions. 4,447,336, Cl. 252-7.000.
Vandersall, Howard L.: *See*—
Adl, Mohammad S.; Kegeler, Gary H.; and Vandersall, Howard L., 4,447,337, Cl. 252-7.000.
Vandervelden, C. Keith: *See*—
Runnells, Robert R.; Haak, Peter A.; Larkin, Rodney B.; and Vandervelden, C. Keith, 4,447,399, Cl. 422-113.000.
van Dyke, Martin J., to Honeywell Inc. Magnetoresistive transducer apparatus. 4,447,781, Cl. 324-83.00A.
VanHorn, David D.; Putz, John M.; and Henderson, Alfred J., Jr., to General Electric Company. Reflector lamp. 4,447,865, Cl. 362-305.000.
Van Siclen, Howard E., Jr., to Bendix Corporation, The. Photoelectric isolation circuit for an internal combustion engine ignition system. 4,446,841, Cl. 123-602.000.
Van Sikle, Truman T.; and Drake, Charles J., to Kelsey Hayes Company. Welding system monitoring and control system. 4,447,698, Cl. 219-110.000.
van't Veld, Cecil W. Retractable landing net. 4,446,646, Cl. 43-12.000.
Varco International, Inc.: *See*—
Boyadjieff, George I; and Monahan, Frederick A., 4,446,761, Cl. 81-57.190.
Varma, Ravi K., to E. R. Squibb & Sons, Inc. Androstene-17-dithioketals. 4,447,363, Cl. 260-397.300.
Varo, Inc.: *See*—
Evans, William E.; and Gillett, Jimmie D., 4,447,867, Cl. 363-56.000.
Varta Batterie Aktiengesellschaft: *See*—
Chobanov, Tsvetko; Kunze, Dieter; and Woeffler, Friedrich, 4,447,376, Cl. 264-42.000.
Wagner, Armin, 4,447,379, Cl. 264-61.000.
Vartoughian, Victor. Automatic applicator bottles. 4,447,169, Cl. 401-269.000.
VEB Schwermaschinenbaukombinat TAKRAF: *See*—
Kersten, Peter; Meixner, Peter; Muller, Erich; and Horing, Eckart, 4,447,165, Cl. 384-428.000.
Vecera, Jiri: *See*—
Sirokorad, Jurij; and Vecera, Jiri, 4,446,741, Cl. 73-654.000.
Velsicol Chemical Corporation: *See*—
Traxler, James T., 4,447,420, Cl. 424-210.000.
Velte, Karl-Heinz, to Rothenberger GmbH & Co. Werkzeuge-Maschinen KG. Tube cutter, especially for plastic tubes. 4,446,620, Cl. 30-96.000.
Venkatasubramanian, Kalyanasundram: *See*—
Coker, Lowell E.; and Venkatasubramanian, Kalyanasundram, 4,447,532, Cl. 435-99.000.
Ventker, Heinz; and Wendlinger, Fred, to Rheinhold & Mahla Dammstoffe GmbH. Laminated mineral fibre mat and processes for its production. 4,447,490, Cl. 428-285.000.
Verhees, Leonardus G. J.: *See*—
Moerkens, Jozef C.; and Verhees, Leonardus G. J., 4,447,759, Cl. 315-60.000.
Verter, Allan H. Arm and shoulder brace. 4,446,858, Cl. 128-94.000.
Vicik, Stephen J.: *See*—
Lustig, Stanley; Schuetz, Jeffrey M.; and Vicik, Stephen J., 4,447,480, Cl. 428-35.000.
Victor Company of Japan, Ltd.: *See*—
Sugiyama, Hiroyuki, 4,447,834, Cl. 358-310.000.
Vinzens, Kurt: *See*—
Jansing, Walter; and Vinzens, Kurt, 4,446,820, Cl. 122-32.000.
Vioglio, Sergio: *See*—
Franceschi, Giovanni; Marsili, Leonardo; Sanfilippo, Aurora; and Vioglio, Sergio, 4,447,432, Cl. 424-248.540.
Visidyne, Inc.: *See*—
Shepherd, Orr, 4,447,770, Cl. 318-618.000.
Vitino Massenzana s.r.l.: *See*—
Lussana, Riccardo; and Massenzana, Fabrizio, 4,447,285, Cl. 156-473.000.
Vitro-Tec Fideicomiso: *See*—
Heredia de la Paz, Jorge A.; and Sanchez, David F., 4,446,888, Cl. 137-596.170.
Vittore, Lorenzo: *See*—
Vallarino, Angelo; and Vittore, Lorenzo, 4,447,525, Cl. 430-539.000.
Vora, Bipin V., to UOP Inc. Adsorbent regeneration in integrated etherification process. 4,447,653, Cl. 568-697.000.
Vorih, William J.: *See*—
Baldoni, Viscardo; and Vorih, William J., 4,447,171, Cl. 403-381.000.
Voss, Julian D.; Allori, Aldo; and Wilger, John A., to International Harvester Co. Clutch oil shield and diverter. 4,446,953, Cl. 192-70.120.
Vrieland, Bruce C.: *See*—
Hardin, Tommy G.; and Vrieland, Bruce C., 4,446,689, Cl. 57-204.000.
Vroman Foods, Inc.: *See*—
Roth, Thomas E.; and Getman, Harlan R., 4,447,458, Cl. 426-275.000.
Vulcano, Vincent. Sorting machine for sorting covers. 4,447,715, Cl. 235-454.000.
Vyskummy ustav vodneho hospodarstva: *See*—
Zajdlik, Miroslav, 4,447,322, Cl. 210-104.000.
Vyvial, Rudolf: *See*—
Henne, Andreas; Hesse, Anton; Jacobi, Manfred; Schornick, Gunnar; Vyvial, Rudolf; and Holoch, Klaus, 4,447,520, Cl. 430-281.000.
W. R. Grace & Co.: *See*—
Block, Jacob, 4,447,341, Cl. 252-8.50A.
W. T. Rogers Co.: *See*—
Graham, William T.; and Wenkman, Gregory, 4,447,483, Cl. 428-105.000.
Wada, Yoshihiro, to Sharp Kabushiki Kaisha. Graphic display in an electronic thermometer. 4,447,884, Cl. 364-557.000.

Wagener, Dietrich; Sander, Theo; and Laue, Karl H., to Didier Engineering GmbH. Process for the elimination of ammonia in coke plant waste waters. 4,447,333, Cl. 210-750.000.

Wager, Mats; and Hirschberg, Jakub, to Siemens Aktiengesellschaft. Device for separating individual sheets combined into a stack. 4,447,053, Cl. 271-113.000.

Wagers, Robert S., to Texas Instruments Incorporated. Broad band surface acoustic wave edge deposited transducer. 4,447,754, Cl. 310-313.00R.

Wagner, Armin, to Varta Batterie Aktiengesellschaft. Production of ceramic lithium nitride. 4,447,379, Cl. 264-61.000.

Wagner, John R., Jr.; and Hein, Carl C., to Mobil Oil Corporation. Oriented multilayer heat sealable packaging film. 4,447,494, Cl. 428-349.000.

Walbro Corporation: *See*—
Tuckey, Charles H., 4,447,192, Cl. 417-360.000.

Walbro Far East, Inc.: *See*—
Kobayashi, Hiroto; and Kobayashi, Takeshi, 4,447,370, Cl. 261-35.000.

Walker, Thad O.: *See*—
Lundberg, Robert D.; Walker, Thad O.; O'Farrell, Charles P.; and Makowski, Henry S., deceased, 4,447,338, Cl. 252-8.50M.

Walls, Lester L., Jr.: *See*—
Weisner, Kent A.; and Walls, Lester L., Jr., 4,447,200, Cl. 425-388.000.

Walter, Bert: *See*—
Greenquist, Alfred C.; Rupchock, Patricia A.; Tyhach, Richard J.; and Walter, Bert, 4,447,529, Cl. 435-7.000.

Walter, John: *See*—
Roth, Donald J.; Walter, John; and Kubis, Charles S., 4,446,984, Cl. 220-268.000.

Walter Kidde & Co., Inc.: *See*—
Martin, Roy T., 4,446,923, Cl. 169-45.000.

Waltersdorfer, Anna: *See*—
Stahler, Gerhard; and Waltersdorfer, Anna, 4,447,444, Cl. 424-273.00P.

Walton, Thomas A. Electric regeneration system for gas turbine. 4,446,694, Cl. 60-39.182.

Walz, Joachim, to Siemens Aktiengesellschaft. Method and apparatus for reducing graphic patterns. 4,447,882, Cl. 364-521.000.

Wang, Robert, to Heurtey, Stein. Galvanization installations of metallic bands. 4,446,812, Cl. 118-63.000.

Wang, Shih-Ping, to Diagnostic Information, Inc. Panel type X-ray image intensifier tube and radiographic camera system. 4,447,721, Cl. 250-213.0VT.

Wang, Timothy, to Boeing Company, The. Upper surface blown powered lift system for aircraft. 4,447,027, Cl. 244-212.000.

Wang, Timothy, to Boeing Company, The. Upper surface blown powered lift system for aircraft. 4,447,028, Cl. 244-212.000.

Wang, Yu-Chang J.; Dursch, Friedrich; O'Laughlin, Richard L.; and Prusik, Thaddeus, to E. R. Squibb & Sons, Inc. Steroid monohydrates, formulations containing same and method. 4,447,426, Cl. 424-243.000.

Wanner, Karl: *See*—
Bleicher, Manfred; Buck, Manfred; Falchle, Jorg; and Wanner, Karl, 4,446,931, Cl. 173-48.000.

Ward, William C.: *See*—
Marks, Robert; Phelps, Douglas W., Jr.; and Ward, William C., 4,447,857, Cl. 361-395.000.

Warneke, Helmut: *See*—
Arndt, Manfred; Breier, Walter; Riegert, Hermann; Schmidt, Heinz; Schwarz, Hermann; and Warneke, Helmut, 4,446,978, Cl. 215-13.00R.

Warner, Charles E., to Milliken Research Corporation. Bar balloon control. 4,446,690, Cl. 57-284.000.

Warner, Charles E., to Milliken Research Corporation. High A.C.-D.C. yarn tension control. 4,446,691, Cl. 57-284.000.

Warner-Lambert Company: *See*—
Davison, John A., 4,446,866, Cl. 128-340.000.

Warren, Donald W., to Kennametal Inc. Cutting insert. 4,447,175, Cl. 407-114.000.

Wass, Anthony C. L.: *See*—
Baum, Eric A.; Davies, Leslie J.; Kirk, William F.; and Wass, Anthony C. L., 4,446,862, Cl. 128-203.150.

Watanabe, Hiroshi: *See*—
Kitamura, Yasuo; Suzuki, Masao; Kubota, Toshio; Watanabe, Hiroshi; and Tsujimoto, Masaaki, 4,446,881, Cl. 137-1.000.

Watanabe, Kiyoshi; Ideguchi, Satoshi; Ogura, Masahiro; Shimada, Masahiko; and Kawaharada, Hajime, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for the production of coenzyme Q. 4,447,362, Cl. 260-396.00R.

Watanabe, Masaru; Matsumura, Satoru; Amada, Takayoshi; Irie, Hiromitsu; and Saito, Norihisa, to Tokyo Shibaura Denki Kabushiki Kaisha. Scraping blades for use in thin film dryers. 4,447,293, Cl. 159-6.200.

Watanabe, Shoji; and Miho, Takuya, to Daicel Chemical Industries, Ltd. Polyurethane. 4,447,591, Cl. 528-80.000.

Watanabe, Syuji; Ishii, Yoshitaro; and Sunagawa, Masao, to Hitachi, Ltd. Upright type electric cleaner. 4,446,594, Cl. 15-323.000.

Watanabe, Yoshio: *See*—
Iyama, Hiroyuki; and Watanabe, Yoshio, 4,447,763, Cl. 315-207.000.

Watase, Yoshiyuki: *See*—
Kusumegi, Asao; Kondo, Kenjiro; Watase, Yoshiyuki; Yoshimura, Yoshio; and Miyake, Kozo, 4,447,734, Cl. 250-517.100.

Waterman, Theodore. Power assist, manual, band labeler. 4,446,616, Cl. 29-775.000.

Waters, Edwin R.: *See*—
Dyce, John W.; Waters, Edwin R.; and Sherwood, Cy E., 4,447,100, Cl. 339-14.00R.

Watson, Robert L.; and Rayburn, Robert L. Emergency ventilation tube. 4,446,864, Cl. 128-207.140.

Watson, Roy H. A., III. Sailing course computer. 4,446,729, Cl. 73-178.00R.

Webasto-Werk W. Baier GmbH & Co.: *See*—
Galtz, Rudiger; and Reinhardt, Rudolf, 4,447,187, Cl. 415-53.00R.

Webb, Harry A.: *See*—
Lawrence, Jackson; Webb, Harry A.; and Frederick, John R., 4,446,606, Cl. 26-18.600.

Webb, John A.: *See*—
McLellan, Edward J.; and Webb, John A., 4,447,151, Cl. 356-218.000.

Weber, James L., to Rockwell International Corporation. Connecting rod and piston device for a brake slack adjuster. 4,446,949, Cl. 188-79.50K.

Weglin, Walter, to Jerobee Industries, Inc. Die and method of making same. 4,447,286, Cl. 156-515.000.

Wegman, Richard W., to Union Carbide Corporation. Process for making aldehydes from ketals. 4,447,648, Cl. 568-484.000.

Wehling, Bernhard, to Bayer Aktiengesellschaft. Process for mass-dyeing of thermoplastics: polystyrene and styrene copolymers with indoline methine dyes. 4,447,244, Cl. 8-514.000.

Wehling, Bernhard: *See*—
Schellhammer, Carl-Wolfgang; and Wehling, Bernhard, 4,447,651, Cl. 568-645.000.

Wehr Corporation: *See*—
Long, Gary R.; and Dorsey, Robert J., 4,447,198, Cl. 425-140.000.

Wehrmacher, Bill H.: *See*—
Flygstad, Dean W.; and Wehrmacher, Bill H., 4,447,836, Cl. 360-15.000.

Weilacher, Karl H., to GAO Gesellschaft fur Automation und Organisation mbH. Method of testing the weight per unit area of thin material. 4,446,735, Cl. 73-597.000.

Weinerman, Brent: *See*—
Rubin, Howard; and Weinerman, Brent, 4,446,863, Cl. 128-204.180.

Weinert, Friedrich. Oceanic mining system. 4,446,636, Cl. 37-54.000.

Weingand, Kaspar: *See*—
Schuster-Woldan, Hans; Buerk, Hermann; Koch, Dirk; and Weingand, Kaspar, 4,447,292, Cl. 156-644.000.

Weinrotter, Klaus: *See*—
Stern, Gerhard; and Weinrotter, Klaus, 4,447,568, Cl. 524-101.000.

Weirauch, Donald F., to Texas Instruments Incorporated. Oxide-free CdTe synthesis. 4,447,393, Cl. 420-590.000.

Weisner, Kent A.; and Walls, Lester L., Jr., to Kenergy Corporation. Apparatus for molding skylights. 4,447,200, Cl. 425-388.000.

Weiss, Hermann, to Stihl, Andreas. Centrifugal clutch for power saws. 4,446,954, Cl. 192-105.0CD.

Weiss, Richard: *See*—
Simm, Manfred; Spiess, Karl-Heinz; and Weiss, Richard, 4,447,488, Cl. 428-213.000.

Weiss, Richard L.: *See*—
Murchison, Craig B.; Stowe, Robert A.; and Weiss, Richard L., 4,447,664, Cl. 585-323.000.

Welch, Donald C.; and Yoerg, Christopher P., to Trane Company, The. Heat exchanger tube circuits. 4,446,915, Cl. 165-144.000.

Weller, Barton L. Universal world time and date clock. 4,447,159, Cl. 368-23.000.

Wellman, George R.: *See*—
Labaw, Clifford S.; and Wellman, George R., 4,447,621, Cl. 548-342.000.

Wells, Richard J.: *See*—
Stone, Lawrence J.; and Wells, Richard J., 4,447,860, Cl. 362-30.000.

Welsh Sporting Goods Corp.: *See*—
Markovich, Mark J., 4,446,900, Cl. 150-52.00R.

Wendlinger, Fred: *See*—
Ventker, Heinz; and Wendlinger, Fred, 4,447,490, Cl. 428-285.000.

Wenkman, Gregory: *See*—
Graham, William T.; and Wenkman, Gregory, 4,447,483, Cl. 428-105.000.

Wennerberg, Arnold N., to Standard Oil Company (Indiana). Dehydrogenation reactions. 4,447,665, Cl. 585-379.000.

Werner, Friedrich; Mannes, Karl; and Trescher, Viktor, to Bayer Aktiengesellschaft. Process for the preparation of 2,4,6-trichloroaniline. 4,447,647, Cl. 564-412.000.

Werth, Dee A.; and Ratchford, Lloyd G., to Bendix Corporation, The. Moisture seal for a separable electrical connection. 4,447,103, Cl. 339-94.00M.

Western Electric Company, Inc.: *See*—
Hobart, Floyd E., Jr., 4,447,109, Cl. 339-256.00R.

Westervelt, Dean C.: *See*—
Saunders, Howard E.; Westervelt, Dean C.; and Elbling, Irving N., 4,447,797, Cl. 336-205.000.

Westinghouse Electric Corp.: *See*—
Eckels, Phillip W., 4,447,670, Cl. 174-15.0CA.
Isenberg, Arnold O., 4,447,204, Cl. 431-76.000.
Price, William L.; Murtha, John C.; Ross, James A., Jr.; Adam, Clyde E.; and Lucas, Kenneth R., 4,447,873, Cl. 364-200.000.
Saunders, Howard E.; Westervelt, Dean C.; and Elbling, Irving N., 4,447,797, Cl. 336-205.000.

Segar, William R.; and Larson, Robert A., 4,447,680, Cl. 191-48.000.
Stol, Israel, 4,447,703, Cl. 219-136.000.
Young, William E.; Lunn, Richard H.; and Archer, David H., 4,447,748, Cl. 310-11.000.

Westland plc: *See*—
Reid, Peter, 4,447,023, Cl. 244-17.110.

Westley, John: *See*—
Liu, Chao-Min; Tresner, Homer D.; and Westley, John, 4,447,533, Cl. 435-119.000.

Weston, Lynn R.: *See*—
Karubian, Ralph; Breukelman, Robert G.; and Weston, Lynn R., 4,446,598, Cl. 17-1.00B.

Westvaco Corporation: *See*—
Schreuders, Hans G.; and Schilling, Peter, 4,447,269, Cl. 106-277.000.

Wheeler, Daryl. Torque transmitting device. 4,446,765, Cl. 81-441.000.

Wheeler, Lionel H.; and Goekler, Robert G., to Crutcher Resources Corporation. Apparatus and method for bending insulated piping. 4,446,713, Cl. 72-308.000.

White, Kenneth R. Valve attachment for pressurized containers. 4,446,987, Cl. 222-89.000.

White, William L.; and Anzeveno, Peter B., to Dow Chemical Company, The. Synthesis of 11-deoxyprostaglandins. 4,447,636, Cl. 560-122.000.

Whited, James S., to Kollmorgen Technologies Corporation. Control system for synchronous brushless motors. 4,447,771, Cl. 18-661.000.

Whiteford, Drummond: *See*—
Bowyer, Michael L.; and Whiteford, Drummond, 4,446,922, Cl. 166-322.000.

Whitehurst, Darrell D.: *See*—
Derbyshire, Francis J.; and Whitehurst, Darrell D., 4,447,310, Cl. 208-8.0LE.

Whitman, Hobart A., III, to Olin Corporation. Method for electrically perforating dielectric webs. 4,447,709, Cl. 219-384.000.

Wickes Corporation, The: *See*—
Berger, Hans G., 4,446,665, Cl. 52-407.000.

Widrig, Jakob: *See*—
Hardt, Jean; and Widrig, Jakob, 4,446,942, Cl. 181-249.000.

Wiedemann, Karl. Vehicle for clearing material from drains and the like. 4,446,591, Cl. 15-315.000.

Wiesner, Otto: *See*—
Otte, Wolf-Dieter; Otte, Heinz; Schider, Siegfried; and Wiesner, Otto, 4,446,857, Cl. 128-92.0BC.

Wiggins Teape Group Limited, The: *See*—
Allen, Roger A.; and Hall, Robert J., 4,447,708, Cl. 219-384.000.

Wiley, Walter H.; and Madden, William M., to United Technologies Corporation. Three-dimensional axially translatable convergent/divergent nozzle assembly. 4,447,009, Cl. 239-265.390.

Wilger, John A.: *See*—
Voss, Julian D.; Allori, Aldo; and Wilger, John A., 4,446,953, Cl. 192-70.120.

Wilkes, Alan: *See*—
Rowe, William; Golda, Eugene; and Wilkes, Alan, 4,447,512, Cl. 430-17.000.

Wilkinson, James H., to Sony Corporation. Error-correction format for digital television signals. 4,447,902, Cl. 371-39.000.

Wilkinson, Stanley B., to General Electric Company. Reactance relay. 4,447,845, Cl. 361-80.000.

Willans, Robert D. H., to Cominco Ltd. Electrode brushing apparatus. 4,447,308, Cl. 204-279.000.

Wille, Herbert: *See*—
Muller, Rolf; and Wille, Herbert, 4,447,623, Cl. 549-36.000.

Williams, Edward W., to EMI Limited. Electroluminescent displays. 4,447,762, Cl. 315-116.000.

Williams, Emyr G.: *See*—
Kay, Ian T.; Bartholomew, David; Williams, Emyr G.; and Noon, Robert A., 4,447,446, Cl. 424-282.000.

Williams International: *See*—
Williams, Sam B., 4,447,024, Cl. 244-23.00A.

Williams International Corporation: *See*—
Davis, Arthur M.; and Pollington, Warren J., 4,447,188, Cl. 415-115.000.

Williams, Robert E., Jr., to General Electric Company. Method for making cyclopolydimethylsiloxanes. 4,447,630, Cl. 556-460.000.

Williams, Sam B., to Williams International. Airborne vehicle. 4,447,024, Cl. 244-23.00A.

Willis, Clive: *See*—
Malatesta, Vincenzo; Willis, Clive; and Hackett, Peter A., 4,447,304, Cl. 204-157.10R.

Wilson, David A.; Buxton, James L.; and Green, Philip S., to SRI International. Frequency controlled hybrid ultrasonic imaging arrays. 4,446,740, Cl. 73-626.000.

Wilson, Kenneth J., to Wilson Tool Company. Locking ring stripper plate assembly. 4,446,767, Cl. 83-136.000.

Wilson, Kermit H.; and Carlson, Ronald R., to Sico Incorporated. Table and improved hinge mechanism. 4,446,796, Cl. 108-69.000.

Wilson Tool Company: *See*—
Wilson, Kenneth J., 4,446,767, Cl. 83-136.000.

Wilson, William W.: *See*—
Christe, Karl O.; and Wilson, William W., 4,447,407, Cl. 423-262.000.

Windish, Willis E.: *See*—
Winzeler, James E.; and Windish, Willis E., 4,446,758, Cl. 74-781.00R.

Windmere Corporation: *See*—
Friedson, Belvin F., 4,446,855, Cl. 128-24.200.

Wing, Thomas W. Electrical treatment method. 4,446,870, Cl. 128-422.000.

Winiecki, Henry F.: *See*—
Winiecki, Tadeus; and Tindel, Thomas F., 4,447,069, Cl. 280-270.000.

Winiecki, Martha M.: *See*—
Winiecki, Tadeus; and Tindel, Thomas F., 4,447,069, Cl. 280-270.000.

Winiecki, Tadeus; and Tindel, Thomas F., to Winiecki, Henry F.; and Winiecki, Martha M., part interest to each. Steering assembly crash resistant motorcycle. 4,447,069, Cl. 280-270.000.

Winter, Roland A. E.: *See*—
Dexter, Martin; and Winter, Roland A. E., 4,447,511, Cl. 430-15.000.

Winther, Douglas N.: *See*—
Allen, Melvin K.; Berri, Ronald J.; and Winther, Douglas N., 4,447,001, Cl. 228-37.000.

Winzeler, James E.; and Windish, Willis E., to Caterpillar Tractor Co. Planetary transmission. 4,446,758, Cl. 74-781.00R.

Wise, Daniel J., to Ex-Cell-O Corporation. Liquid container with straw opening means. 4,446,971, Cl. 206-607.000.

Wise, Stanley S.; and Maitland, Peter, to Fail Safe Industries, Inc. Brake control apparatus. 4,446,950, Cl. 192-3.0TR.

Witco Chemical Corporation: *See*—
Dabi, Shmuel; and Loewrigkeit, Peter, 4,447,571, Cl. 524-192.000.

Withington, Clinton E. Safe bolt mechanism. 4,446,798, Cl. 109-61.000.

Woeffler, Friedrich: *See*—
Chobanov, Tsvetko; Kunze, Dieter; and Woeffler, Friedrich, 4,447,376, Cl. 264-42.000.

Wolcott, Herbert B., Jr., to Atlantic Richfield Company. Method for initiating combustion in a subterranean carbonaceous deposit. 4,446,918, Cl. 166-245.000.

Wolens, John; and Levy, Leon. Novelty headband. 4,447,250, Cl. 46-1 F.

Wolff, Robin K.: *See*—
Spitz, Seymour J., Jr.; Mookherjee, Braja D.; Hill, Ira D.; Keleher, Lloyd F.; Trenkle, Robert W.; and Wolff, Robin K., 4,446,651, Cl. 47-10.000.

Wolff, Walter C.: *See*—
Kelsey, Charles C., Jr.; and Wolff, Walter C., 4,446,645, Cl. 42-50.000.

Wollmann, Klaus: *See*—
Deibig, Heinrich; and Wollmann, Klaus, 4,447,477, Cl. 427-388.300.

Wood, Brian M.: *See*—
Lamb, Paul R.; Bakas, Steve T.; and Wood, Brian M., 4,447,315, Cl. 208-99.000.

Wooding: *See*—
Wooding, Patrick J., 4,446,995, Cl. 222-590.000.

Wooding, Patrick J., to Wooding. Ultrahigh velocity water-cooled copper trough. 4,446,995, Cl. 222-590.000.

Woodruff, Harold F. Portable reel jack stand. 4,447,012, Cl. 242-54.00R.

Woodward, Robert B.: *See*—
Gosteli, Jacques; Ernest, Ivan; and Woodward, Robert B., 4,447,360, Cl. 260-239.00A.

Woodworth, Larry A.: *See*—
Grantland, Gary; Montgomery, Hugh S.; Boeckmann, Eduard F. B.; and Woodworth, Larry A., 4,447,674, Cl. 179-81.00R.

Wool Development International Limited: *See*—
Benisek, Ladislav, 4,447,242, Cl. 8-128.00R.

Worby, Donald, to Lucas Industries Plc. Method of manufacturing a fuel pump. 4,447,194, Cl. 417-572.000.

Workman, Lester J. Pediculicide composition and method of use. 4,447,423, Cl. 424-234.000.

Woytek, Andrew J.; Lileck, John T.; and Steigerwalt, Edward J., to Air Products and Chemicals, Inc. Method and apparatus for perforating or cutting with a solid fueled gas mixture. 4,446,920, Cl. 166-297.000.

Wriegt, Jurgen: *See*—
Baatz, Henning; Rittscher, Dieter; and Wriegt, Jurgen, 4,447,733, Cl. 250-506.100.

Wright, Bruce R. Battery charger assembly. 4,447,785, Cl. 320-25.000.

Wu, Randall: *See*—
Blakeslee, Theodore R., III; and Wu, Randall, 4,447,387, Cl. 264-566.000.

Wuertz, Howard A.: *See*—
Schultz, Charles R.; Tollefson, Mark S.; and Wuertz, Howard A., 4,447,173, Cl. 405-181.000.

Wurttemberische Metallwarenfabrik Aktiengesellschaft: *See*—
Arndt, Manfred; Breier, Walter; Riegert, Hermann; Schmidt, Heinz; Schwarz, Hermann; and Warneke, Helmut, 4,446,978, Cl. 215-13.00R.

Wynn, Stephen R., to General Electric Company. Synthesizer circuit. 4,447,792, Cl. 332-19.000.

Xerox Corporation: *See*—
Burnham, Robert D., 4,447,904, Cl. 372-45.000.
Naramore, Raymond A., 4,447,817, Cl. 346-75.000.
Snelling, Christopher; and Lysy, Dusan G., 4,447,145, Cl. 355-14.00D.
Stoffel, James C., 4,447,830, Cl. 358-283.000.

Yabe, Tetsuo: *See*—
Ushio, Tetsuji; Tatsuguchi, Satoru; Otani, Toshihisa; Tani, Hoshiro; and Yabe, Tetsuo, 4,447,306, Cl. 204-224.00R.

Yamada, Mitsuhiko: *See*—
Ueda, Sadao; Tokura, Isao; and Yamada, Mitsuhiko, 4,447,113, Cl. 358-75.000.

Yamada, Mitsumasa: *See*—
Sekiguchi, Kiyonori; Igashira, Toshihiko; Tanaka, Takeshi; Kawai, Hisasi; Yamada, Mitsumasa; Kawagoe, Michio; and Tanaka, Masaaki, 4,446,839, Cl. 123-569.000.
Yamada, Toshio: *See*—
Omae, Yoshihiro; Okubo, Noboru; Sigyo, Keiichi; Nakajima, Hideo; Fukui, Hiroaki; Yamada, Toshio; and Honda, Hideyuki, 4,447,805, Cl. 340-539.000.
Yamada, Yu, to Canon Kabushiki Kaisha. Optical scanning device. 4,447,147, Cl. 355-51.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Masuda, Yutaka, 4,447,801, Cl. 340-52.00F.
Matsushita, Yukio; and Nozaki, Toshikatsu, 4,446,833, Cl. 123-435.000.
Yamakage, Tetsuro: *See*—
Ochiai, Yoshiki; Nomura, Kenji; Yamakage, Tetsuro; and Takashima, Toshiharu, 4,447,177, Cl. 408-161.000.
Yamamoto, Kiyoshi: *See*—
Hiraoka, Takeshi; Urano, Shigeru; and Yamamoto, Kiyoshi, 4,447,275, Cl. 148-152.000.
Yamamoto, Susumu: *See*—
Suzuki, Fumio; Fujikawa, Yoshihiro; Yamamoto, Susumu; Mizutani, Hidemi; Ohya, Tunehiko; Ikai, Takashi; and Oguchi, Toshihiko, 4,447,256, Cl. 71-86.000.
Yamamoto, Toshio: *See*—
Yuge, Shizuo; Sakakibara, Susumu; Ishikawa, Takuma; Kito, Nobuo; and Yamamoto, Toshio, 4,447,517, Cl. 430-122.000.
Yamamura, Saburo: *See*—
Ohyama, Hiroshi; Takada, Sanae; Morita, Ken; and Yamamura, Saburo, 4,447,259, Cl. 71-94.000.
Yamasaki, Akinobu: *See*—
Maeda, Yasunori; and Yamasaki, Akinobu, 4,447,010, Cl. 239-414.000.
Yamashita, Masato: *See*—
Oana, Yasuhisa; Yasuda, Nobuaki; Yamashita, Masato; and Ozawa, Norio, 4,447,825, Cl. 357-71.000.
Yamashita, Toshio. Automobile fender protector formed of synthetic resin. 4,447,067, Cl. 280-153.00R.
Yamato Scale Company. Ltd.: *See*—
Kawanishi, Shozo, 4,446,938, Cl. 177-25.000.
Yamazaki, Etuo, to Fujitsu Fanuc Limited. Tracer head adjustment method. 4,447,179, Cl. 409-127.000.
Yamazaki, Hiroyuki: *See*—
Hoshiyama, Satoshi; Muto, Hiroyuki; Shinke, Shuzo; Otsuka, Kanji; Takigawa, Shinichiro; and Yamazaki, Hiroyuki, 4,447,661, Cl. 568-882.000.
Yamazaki, Kazutoshi: *See*—
Kamiyama, Fumio; Yamazaki, Kazutoshi; Kohara, Minoru; and Nagata, Mituo, 4,447,328, Cl. 210-635.000.
Yamazaki, Kisuke; Iijima, Hitoshi; Matsuoka, Fumio; and Nishizawa, Toshizo, to Mitsubishi Denki Kabushiki Kaisha. Air conditioning apparatus with temperature regulated cooling. 4,446,704, Cl. 62-180.000.
Yamazaki, Masafumi: *See*—
Suzuki, Mikio; and Yamazaki, Masafumi, 4,446,838, Cl. 123-520.000.
Yamazaki, Seiichi: *See*—
Kogane, Mikio; and Yamazaki, Seiichi, 4,447,146, Cl. 355-28.000.
Yamazaki, Tamotsu: *See*—
Tanemura, Mitsura; Yamazaki, Tamotsu; Mizuno, Koji; Kaiho, Shin-ichi; Kakimoto, Morio; Hoshino, Eiichi; Matsunaga, Isao; and Hata, Shun-ichi, 4,447,453, Cl. 424-319.000.
Yamazoe, Hisamitsu: *See*—
Matsumura, Toshimi; Fujisawa, Hideya; Omori, Norio; Arimura, Takashi; Yamazoe, Hisamitsu; and Nishiura, Kiyotaka, 4,446,832, Cl. 123-339.000.
Yan, Tsoung Y.: *See*—
Angevine, Philip J.; Audeh, Costandi A.; Tabak, Samuel A.; and Yan, Tsoung Y., 4,447,312, Cl. 208-46.000.
Yan, Tsoung-Yuan: *See*—
Fowles, Patrick E.; Shoemaker, Gerald L.; and Yan, Tsoung-Yuan, 4,447,311, Cl. 208-35.000.
Yarwood, John C.; Ungarean, Gary L.; Kindlmann, Peter J.; and Tyler, Derek E., to Olin Corporation. Process and apparatus for electromagnetic casting of multiple strands having individual head control. 4,446,909, Cl. 164-453.000.
Yarwood, John C.: *See*—
Ungarean, Gary L.; and Yarwood, John C., 4,446,908, Cl. 164-452.000.
Yasuda, Nobuaki: *See*—
Oana, Yasuhisa; Yasuda, Nobuaki; Yamashita, Masato; and Ozawa, Norio, 4,447,825, Cl. 357-71.000.
Yasui Sangyo Co., Ltd.: *See*—
Masui, Saburo, 4,447,042, Cl. 254-90.000.
Yasunaga, Masao: *See*—
Nagasaku, Eiichi; Kato, Kimihiro; and Yasunaga, Masao, 4,447,196, Cl. 418-93.000.
Yeager, Zema O. Rotary internal combustion engine. 4,446,829, Cl. 123-244.000.
Yellin. Tobias O.; and Gilman, David J., to Imperial Chemical Industries PLC. Haloalkylguanidine compounds, pharmaceutical compositions and methods, processes and intermediates. 4,447,441, Cl. 424-269.000.
Yoerg, Christopher P.: *See*—
Welch, Donald C.; and Yoerg, Christopher P., 4,446,915, Cl. 165-144.000.
Yokocho, Yoetsu: *See*—
Inaga, Hisashi; and Yokocho, Yoetsu, 4,446,822, Cl. 123-41.310.
Yokogawa Hokushin Electric Corporation: *See*—
Hanaoka, Yuzuru; Murayama, Takeshi; and Muramoto, Setsuo, 4,447,559, Cl. 521-28.000.
Morioka, Akihiro; Maeda, Yuji; Matsumoto, Tetsuro; Yukinari, Masakazu; and Kishida, Eiichi, 4,447,309, Cl. 204-402.000.
Yokota, Koji: *See*—
Terada, Matsuaki; and Yokota, Koji, 4,447,871, Cl. 364-200.000.
Yokoyama, Hirotaka: *See*—
Oguchi, Toshihiko; Kato, Hirohisa; and Yokoyama, Hirotaka, 4,447,467, Cl. 427-48.000.
Yoneda, Kenji; Arai, Shoji; and Kusome, Yoshimi, to Nissan Motor Co., Ltd. System for feedback control of air-fuel ration in internal combustion engine. 4,446,834, Cl. 123-440.000.
Yonemoto, Masashi: *See*—
Kajiyama, Ryuichi; and Yonemoto, Masashi, 4,446,946, Cl. 187-29.00R.
Yoshida, Ryo: *See*—
Noguchi, Hiroshi; Yoshida, Ryo; Sumida, Seizo; and Kamoshita, Katsuzo, 4,447,260, Cl. 71-118.000.
Yoshida, Shigeru: *See*—
Kojima, Takafumi; Yoshida, Shigeru; and Mizoguchi, Masayuki, 4,447,679, Cl. 179-175.30R.
Yoshihara, Mikio: *See*—
Suzuki, Koichi; Yoshihara, Mikio; Kawai, Shinji; and Mori, Katsuhiro, 4,446,584, Cl. 4-237.000.
Yoshihisa, Kozo, to Tokyo Shibaura Denki Kabushiki Kaisha. Mode discrimination circuit. 4,447,901, Cl. 370-74.000.
Yoshimura, Hironori: *See*—
Sugizawa, Taijiro; Yoshimura, Hironori; and Toyama, Junichi, 4,447,263, Cl. 75-233.000.
Yoshimura, Yoshio: *See*—
Kusumegi, Asao; Kondo, Kenjiro; Watase, Yoshiyuki; Yoshimura, Yoshio; and Miyake, Kozo, 4,447,734, Cl. 250-517.100.
Yosim, Samuel J.: *See*—
Gay, Richard L.; Kohl, Arthur L.; and Yosim, Samuel J., 4,447,262, Cl. 75-65.00R.
Youmans, Barry J.; and Zimmerlin, Sharon L., to Babcock & Wilcox Company, The. Linearizing circuit and method of calibrating same. 4,447,780, Cl. 324-132.000.
Young, Donald C., to Union Oil Company of California. Topical fertilization methods and compositions for use therein. 4,447,253, Cl. 71-28.000.
Young, Lewis B., to Mobil Oil Corporation. Preparation of alkyl carboxylates. 4,447,642, Cl. 560-247.000.
Young, Murray M. Bioconversion of industrial cellulosic pulp materials to protein-enriched product. 4,447,530, Cl. 435-68.000.
Young, Steven A.: *See*—
Stover, Richard W.; Proper, Frederick T.; and Young, Steven A., 4,447,061, Cl. 277-1.000.
Young, William E.; Luna, Richard H.; and Archer, David H., to Westinghouse Electric Corp. High temperature corrosion and erosion resistant electrode. 4,447,748, Cl. 310-11.000.
Yuasa, Kazuhiro; and Furukawa, Noboru, to Ricoh Company, Ltd. Method and apparatus of electrostatic recording. 4,447,821, Cl. 346-154.000.
Yuge, Shizuo; Sakakibara, Susumu; Ishikawa, Takuma; Kito, Nobuo; and Yamamoto, Toshio, to Minolta Camera Kabushiki Kaisha. Method of developing electrostatic latent images. 4,447,517, Cl. 430-122.000.
Yukinari, Masakazu: *See*—
Morioka, Akihiro; Maeda, Yuji; Matsumoto, Tetsuro; Yukinari, Masakazu; and Kishida, Eiichi, 4,447,309, Cl. 204-402.000.
Yunker, Conrad E.; Cory, John C.; and Meibos, Harold R., to United States of America, Health and Human Services. Tick cell lines. 4,447,537, Cl. 435-235.000.
Yunt, Fred W., to Northrop Corporation. Machine parts expander hold down. 4,447,183, Cl. 411-57.000.
Yurdin, Carl: *See*—
Sealfon, Andrew; and Yurdin, Carl, 4,447,232, Cl. 604-134.000.
Zajdlik, Miroslav, to Vyskummy ustav vodneho hospodarstva. Apparatus for the cyclone separation of liquids having different densities. 4,447,322, Cl. 210-104.000.
Zauner, Otto; and Bender, Fred, to Owens-Illinois, Inc. Tubing loader. 4,446,960, Cl. 198-408.000.
Zeng, Li-Wen: *See*—
Shang, Jer-Yu; Notestein, John E.; Mei, Joseph S.; and Zeng, Li-Wen, 4,447,297, Cl. 202-99.000.
Zibu, Mitsuo, to Sharp Kabushiki Kaisha. Pre-charge for the bit lines of a random access memory. 4,447,892, Cl. 365-156.000.
Ziegler, William H., Jr.: *See*—
Cunard, Joel C.; and Ziegler, William H., Jr., 4,447,093, Cl. 301-63.0PW.
Ziemelis, Maris J.: *See*—
Swihart, Terence J.; and Ziemelis, Maris J., 4,447,499, Cl. 428-447.000.
Zilisch, Kenneth P. Solar panel with storage. 4,446,850, Cl. 126-431.000.
Zimmerlin, Sharon L.: *See*—
Youmans, Barry J.; and Zimmerlin, Sharon L., 4,447,780, Cl. 324-132.000.
Zinger, George: *See*—
Sugahara, Byron M.; Freelund, Avrum A.; and Zinger, George, 4,446,805, Cl. 114-76.000.
Zoecon Corporation: *See*—
Henrick, Clive A., 4,447,613, Cl. 546-300.000.
Zollner, Dieter H.; Lauterbach-Dammler, Inge; and Rittmann, Friedrich, to C. Conradty Nurnberg GmbH & Co. Kg. Electrode holder for use in fusion electrolysis. 4,447,300, Cl. 204-67.000.
Zonak, Armin: *See*—
Eggers, Manfred; and Zonak, Armin, 4,446,772, Cl. 89-37.00E.
Zucker, Friedrich J.; and Osthaus, Georg, to Supraton F. J. Zucker GmbH. Process for the recovery of a concentrated stillage. 4,447,535, Cl. 435-162.000.
Zuech, Ernest A.: *See*—
Murtha, Timothy P.; and Zuech, Ernest A., 4,447,554, Cl. 502-73.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF MAY, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Combustion Engineering, Inc.: *See*—
Klumb, Ralph H.; and Hutchinson, John J., Re. 31,583, Cl. 376-364.000.

Gesellschaft fur digitale Automation mbH: *See*—
Richter, Hans, Re. 31,581, Cl. 414-730.000.

Higashiyama, Kazuhiro: *See*—
Hosaka, Akio; and Higashiyama, Kazuhiro, Re. 31,582, Cl. 364-431.040.

Hosaka, Akio; and Higashiyama, Kazuhiro, to Nissan Motor Company, Limited. Automatic control system for method and apparatus for checking devices of an automotive vehicle in use with a microcomputer. Re. 31,582, Cl. 364-431.040.

Hutchinson, John J.: *See*—
Klumb, Ralph H.; and Hutchinson, John J., Re. 31,583, Cl. 376-364.000.

Klumb, Ralph H.; and Hutchinson, John J., to Combustion Engineering, Inc. Fuel assembly hold-down device. Re. 31,583, Cl. 376-364.000.

Nissan Motor Company, Limited: *See*—
Hosaka, Akio; and Higashiyama, Kazuhiro, Re. 31,582, Cl. 364-431.040.

Richter, Hans, to Gesellschaft fur digitale Automation mbH. Apparatus for detecting forces directing the movement of a manipulating instrument. Re. 31,581, Cl. 414-730.000.

LIST OF DESIGN PATENTEES

A.R.F. Products, Inc.: *See*—
Owerko, John R., 273,786, Cl. D14-95.000.

Abbott Laboratories: *See*—
Holen, James T., 273,807, Cl. D24-56.000.

Abe, Takeshi: *See*—
Shibayama, Masato; Abe, Takeshi; Asakawa, Yoshifumi; Kinoshita, Seiji; and Ogawa, Kazuhisa, 273,784, Cl. D14-53.000.

Aker, Kevin R.; and Martin, Jeffery G., to Huffy Corporation. Bicycle console. 273,775, 5-8-84, Cl. D12-114.000.

Ali, Frank F. Holder for an abrasive surface. 273,758, 5-8-84, Cl. D8-71.000.

Anderson, Duane L.; Morris, Lewis R.; Cummings, Kenneth W.; and Clarke, Robert S., to First Champaign Corporation. Motorcycle fairing. 273,779, 5-8-84, Cl. D12-182.000.

Antonis, Basil: *See*—
Chapman, John M.; and Antonis, Basil, 273,809, Cl. D26-3.000.

Appel, Mel; and Kress, George, to Appel, Mel. Air traffic controller game housing. 273,800, 5-8-84, Cl. D21-13.000.

Asakawa, Yoshifumi: *See*—
Shibayama, Masato; Abe, Takeshi; Asakawa, Yoshifumi; Kinoshita, Seiji; and Ogawa, Kazuhisa, 273,784, Cl. D14-53.000.

Atlantic Richfield Company: *See*—
Case, Robert, 273,813, Cl. D99-28.000.

Ault, Charles M., to Termiflex Corporation. Case for a keyboard and display unit. 273,788, 5-8-84, Cl. D14-114.000.

Automatic Liquid Packaging, Inc.: *See*—
Weiler, Gerhard H., 273,767, Cl. D9-352.000.

Barry, Bernard R. Flower pot holder. 273,736, 5-8-84, Cl. D6-130.000.

Bausch & Lomb, Inc.: *See*—
Markovitz, Aaron M.; and Ramp, Robert H., 273,794, Cl. D16-112.000.

Bayerische Motoren Wereke A.G.: *See*—
Luthe, Claus; Rennen, Manfred; and Braun, Hans, 273,780, Cl. D12-190.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Luthe, Claus; Rennen, Manfred; and Braun, Hans, 273,773, Cl. D12-92.000.

Bolesky, Richard C.; Cindrich, Nicholas; and Doll, Michael H., to Zimmer, Inc. Reamer/rasp tool, with disposable, debris retaining cutting surface. 273,806, 5-8-84, Cl. D24-28.000.

Bousman, William J., to Western Publishing Company. Sound emitting probe for toy or similar article. 273,802, 5-8-84, Cl. D21-64.000.

Braun, Hans: *See*—
Luthe, Claus; Rennen, Manfred; and Braun, Hans, 273,773, Cl. D12-92.000.
Luthe, Claus; Rennen, Manfred; and Braun, Hans, 273,780, Cl. D12-190.000.

Brentini, Attilio. Key ring. 273,722, 5-8-84, Cl. D3-65.000.

Bridgestone Tire Company Limited: *See*—
Igarashi, Toshio; and Nishio, Hideaki, 273,777, Cl. D12-147.000.

Bulgari, Marina, to Marina B Creation S.A. Ring. 273,771, 5-8-84, Cl. D11-34.000.

Bulgari, Marina, to Marina B Creation S.A. Ring. 273,772, 5-8-84, Cl. D11-35.000.

Cafiero, Vincent, to Simmons Universal Corporation. Chair. 273,728, 5-8-84, Cl. D6-30.000.

Cafiero, Vincent, to Simmons Universal Corporation. Arm chair. 273,730, 5-8-84, Cl. D6-31.000.

Case, Robert, to Atlantic Richfield Company. Credit card terminal. 273,813, 5-8-84, Cl. D99-28.000.

Castillo, Richard M. Picture frame. 273,744, 5-8-84, Cl. D6-234.000.

Chapman, John M.; and Antonis, Basil, to Thorn EMI Limited. Fluorescent lamp. 273,809, 5-8-84, Cl. D26-3.000.

Chapman, Leif H., to General Motors Corporation. Wheel cover. 273,781, 5-8-84, Cl. D12-211.000.

Cillario, Lorenzo, to Ferrero S.p.A. Container for cream-like edible products. 273,765, 5-8-84, Cl. D9-341.000.

Cindrich, Nicholas: *See*—
Bolesky, Richard C.; Cindrich, Nicholas; and Doll, Michael H., 273,806, Cl. D24-28.000.

Claman, Mike T. Chair. 273,733, 5-8-84, Cl. D6-57.000.

Clarke, Robert S.: *See*—
Anderson, Duane L.; Morris, Lewis R.; Cummings, Kenneth W.; and Clarke, Robert S., 273,779, Cl. D12-182.000.

Coca-Cola Company, The: *See*—
Sedam, Jason K.; and Richter, Simon J., 273,768, Cl. D9-375.000.

Combi Co., Ltd.: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 273,727, Cl. D6-7.000.

Cummings, Kenneth W.: *See*—
Anderson, Duane L.; Morris, Lewis R.; Cummings, Kenneth W.; and Clarke, Robert S., 273,779, Cl. D12-182.000.

Cunningham, Jo Ann; Gilliss, Catherine A.; and Gorzo, Patricia M., to United States of America, National Aeronautics and Space Administration. Computer table. 273,742, 5-8-84, Cl. D6-179.000.

Darrell, Jack. In-out symbol for automatic opening hinged glass doors. 273,799, 5-8-84, Cl. D20-11.000.

Davidson, Grant M. N., to U.S. Philips Corporation. Clock radio receiver. 273,785, 5-8-84, Cl. D14-73.000.

Davis, William J., to Interdynamics, Inc. Portable air compressor. 273,789, 5-8-84, Cl. D15-9.000.

Designs for Vision, Inc.: *See*—
Feinbloom, Richard E.; Lepczynski, Richard; and Oleksy, Waldyslaw, 273,782, Cl. D13-24.000.

Doll, Michael H.: *See*—
Bolesky, Richard C.; Cindrich, Nicholas; and Doll, Michael H., 273,806, Cl. D24-28.000.

Dresser Industries, Inc.: *See*—
Monigle, Glenn W.; and Roecker, David W., 273,790, Cl. D15-9.100.
Monigle, Glenn W.; and Roecker, David W., 273,791, Cl. D15-9.100.

Drori, Michael. Nail driver. 273,759, 5-8-84, Cl. D8-75.000.

Eldon Industries, Inc.: *See*—
Evenson, Mel, 273,735, Cl. D6-114.000.

Ender, Herman R., Sr. Machine for inverting a hay windrow. 273,792, 5-8-84, Cl. D15-27.000.

Evans, Homer E. Multi-purpose tool for can pull-tabs, slide fasteners, or the like. 273,757, 5-8-84, Cl. D8-18.000.

Evenson, Mel, to Eldon Industries, Inc. Collating rack. 273,735, 5-8-84, Cl. D6-114.000.

Feinbloom, Richard E.; Lepczynski, Richard; and Oleksy, Waldyslaw, to Designs for Vision, Inc. Universal cable connector for fiber optic cables and the like. 273,782, 5-8-84, Cl. D13-24.000.

Ferrero S.p.A.: *See*—
Cillario, Lorenzo, 273,765, Cl. D9-341.000.

Filhol, Stuart J. Dental pin dispenser package. 273,805, 5-8-84, Cl. D24-10.000.

First Champaign Corporation: *See*—
Anderson, Duane L.; Morris, Lewis R.; Cummings, Kenneth W.; and Clarke, Robert S., 273,779, Cl. D12-182.000.

Forrest, Eugene F. Movable vehicle for the handicapped. 273,776, 5-8-84, Cl. D12-128.000.

Fueloep, Karl. Modular liquid or gas manifold for a swimming pool solar heater. 273,804, 5-8-84, Cl. D23-127.000.

General Motors Corporation: *See*—
Chapman, Leif H., 273,781, Cl. D12-211.000.

Gilliss, Catherine A.: *See*—
Cunningham, Jo Ann; Gilliss, Catherine A.; and Gorzo, Patricia M., 273,742, Cl. D6-179.000.

Gillow, Louis S. Toothbrush. 273,724, 5-8-84, Cl. D4-25.000.

Goetz, Charles R., to Stylette Plastics, Inc. Tray. 273,725, 5-8-84, Cl. D4-38.200.

Gorzo, Patricia M.: *See*—
Cunningham, Jo Ann; Gilliss, Catherine A.; and Gorzo, Patricia M., 273,742, Cl. D6-179.000.

Hammock Shop, Inc., The: *See*—
Saiger, Herbert C., 273,734, Cl. D6-73.000.

Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, to Sharp Corporation. Microwave oven. 273,747, 5-8-84, Cl. D7-351.000.

Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, to Sharp Corporation. Microwave oven. 273,748, 5-8-84, Cl. D7-351.000.

Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, to Sharp Corporation. Microwave oven. 273,749, 5-8-84, Cl. D7-351.000.

Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, to Sharp Corporation. Microwave oven. 273,750, 5-8-84, Cl. D7-351.000.

Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, to Sharp Corporation. Microwave oven. 273,751, 5-8-84, Cl. D7-351.000.

Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, to Sharp Corporation. Microwave oven. 273,752, 5-8-84, Cl. D7-351.000.

Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, to Sharp Corporation. Microwave oven. 273,753, 5-8-84, Cl. D7-351.000.

Haruguchi, Kenici; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, to Sharp Corporation. Microwave oven. 273,754, 5-8-84, Cl. D7-351.000.

Hiroshi Hukuba: *See*—
Hukuba, Hiroshi; and Nakamura, Nobuji, 273,723, Cl. D4-15.000.

Hitachi, Ltd.: *See*—
Shibayama, Masato; Abe, Takeshi; Asakawa, Yoshifumi; Kinoshita, Seiji; and Ogawa, Kazuhisa, 273,784, Cl. D14-53.000.

Holce, Thomas J.; and Huckins, Charles M., to Sentrol, Inc. Explosion-proof housing for electrical circuit components. 273,783, 5-8-84, Cl. D13-40.000.

Holen, James T., to Abbott Laboratories. Sample cup or the like. 273,807, 5-8-84, Cl. D24-56.000.

Hollwarth, Armin: *See*—
Steigerwald, Franz; Zulauf, Karlheinz; and Hollwarth, Armin, 273,764, Cl. D9-369.000.

Huckins, Charles M.: *See*—
Holce, Thomas J.; and Huckins, Charles M., 273,783, Cl. D13-40.000.

Huffy Corporation: *See*—
Aker, Kevin R.; and Martin, Jeffery G., 273,775, Cl. D12-114.000.

Hukuba, Hiroshi; and Nakamura, Nobuji, to Hiroshi Hukuba. Electric toothbrush holder. 273,723, 5-8-84, Cl. D4-15.000.

Hunt, Dale A. Taco holder. 273,746, 5-8-84, Cl. D7-76.000.

Igarashi, Toshio; and Nishio, Hideaki, to Bridgestone Tire Company Limited. Vehicle tire. 273,777, 5-8-84, Cl. D12-147.000.

Inter-Ikea A/S: *See*—
Lundgren, Gillis L. A., 273,743, Cl. D6-191.000.

Interdynamics, Inc.: *See*—
Davis, William J., 273,789, Cl. D15-9.000.

Ishii, Yoshiyasu: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 273,727, Cl. D6-7.000.

Jagger, Vivienne D., to Little People Limited. Drinking vessel. 273,745, 5-8-84, Cl. D7-9.000.

Johnson, Graham J. Putting aid for golfers. 273,803, 5-8-84, Cl. D21-234.000.

Kawaishi, Masayoshi: *See*—
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,747, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,748, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,749, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,750, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,751, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,752, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,753, Cl. D7-351.000.
Haruguchi, Kenici; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,754, Cl. D7-351.000.

Keiser, Bruce, to Keiser Sterling Corporation. Table. 273,738, 5-8-84, Cl. D6-175.000.

Keiser Sterling Corporation: *See*—
Keiser, Bruce, 273,738, Cl. D6-175.000.

Kinoshita, Seiji: *See*—
Shibayama, Masato; Abe, Takeshi; Asakawa, Yoshifumi; Kinoshita, Seiji; and Ogawa, Kazuhisa, 273,784, Cl. D14-53.000.

Koves, Thomas. Adjustable table. 273,741, 5-8-84, Cl. D6-178.000.

Kress, George: *See*—
Appel, Mel; and Kress, George, 273,800, Cl. D21-13.000.

Krieger, John: *See*—
Pelly, Charles W.; and Krieger, John, 273,729, Cl. D6-30.000.

Lampe, Deirdre A., to Pavlova Pantry Pty. Ltd. Packaging container. 273,766, 5-8-84, Cl. D9-352.000.

Lepczynski, Richard: *See*—
Feinbloom, Richard E.; Lepczynski, Richard; and Oleksy, Waldyslaw, 273,782, Cl. D13-24.000.

Levy, Richard C.; Levy, Sheryl; and Piaget, Gary. Child's riding vehicle. 273,774, 5-8-84, Cl. D12-112.000.

Levy, Sheryl: *See*—
Levy, Richard C.; Levy, Sheryl; and Piaget, Gary, 273,774, Cl. D12-112.000.

Little People Limited: *See*—
Jagger, Vivienne D., 273,745, Cl. D7-9.000.

Lundgren, Gillis L. A., to Inter-Ikea A/S. Seat frame. 273,743, 5-8-84, Cl. D6-191.000.

Luthe, Claus; Rennen, Manfred; and Braun, Hans, to Bayerische Motoren Werke Aktiengesellschaft. Automobile. 273,773, 5-8-84, Cl. D12-92.000.

Luthe, Claus; Rennen, Manfred; and Braun, Hans, to Bayerische Motoren Wereke A.G. Rub rail for automobile. 273,780, 5-8-84, Cl. D12-190.000.

Marina B Creation S.A.: *See*—
Bulgari, Marina, 273,771, Cl. D11-34.000.
Bulgari, Marina, 273,772, Cl. D11-35.000.

Markovitz, Aaron M.; and Ramp, Robert H., to Bausch & Lomb, Inc. Sunglasses. 273,794, 5-8-84, Cl. D16-112.000.

Martin, Jeffery G.: *See*—
Aker, Kevin R.; and Martin, Jeffery G., 273,775, Cl. D12-114.000.

Matsuda, Hiroaki: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 273,727, Cl. D6-7.000.

Matthews, Paul C., III. Calculator telephone. 273,787, 5-8-84, Cl. D14-101.000.

Milden, Charles G. Combined binder and easel for storage and use of computer software and instructional material. 273,796, 5-8-84, Cl. D19-27.000.

Minnesota Mining and Manufacturing Company: *See*—
Pearson, Walter C., 273,798, Cl. D19-91.000.

Miyake, Takao: *See*—
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,747, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,748, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,749, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,750, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,751, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,752, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,753, Cl. D7-351.000.
Haruguchi, Kenici; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,754, Cl. D7-351.000.

Monigle, Glenn W.; and Roecker, David W., to Dresser Industries, Inc. Fuel dispenser. 273,790, 5-8-84, Cl. D15-9.100.

Monigle, Glenn W.; and Roecker, David W., to Dresser Industries, Inc. Fuel dispenser. 273,791, 5-8-84, Cl. D15-9.100.

Morris, Lewis R.: *See*—
Anderson, Duane L.; Morris, Lewis R.; Cummings, Kenneth W.; and Clarke, Robert S., 273,779, Cl. D12-182.000.

Nachatelo, Ferrell D. Auto transmission refill tube socket. 273,793, 5-8-84, Cl. D15-150.000.

Nakamura, Nobuji: *See*—
Hukuba, Hiroshi; and Nakamura, Nobuji, 273,723, Cl. D4-15.000.

Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, to Combi Co., Ltd. Baby seat. 273,727, 5-8-84, Cl. D6-7.000.

Nichiei Distribution Systems Inc.: *See*—
Takei, Isao, 273,760, Cl. D8-354.000.
Takei, Isao, 273,761, Cl. D8-354.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Takei, Isao, 273,760, Cl. D8-354.000.
Takei, Isao, 273,761, Cl. D8-354.000.

Nishio, Hideaki: *See*—
Igarashi, Toshio; and Nishio, Hideaki, 273,777, Cl. D12-147.000.

NORDICA S.p.A.: *See*—
Pozzobon, Alessandro, 273,719, Cl. D2-276.000.

Numano, Masafumi: *See*—
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,747, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,748, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,749, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,750, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,751, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,752, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,753, Cl. D7-351.000.
Haruguchi, Kenici; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,754, Cl. D7-351.000.

Ogawa, Kazuhisa: *See*—
Shibayama, Masato; Abe, Takeshi; Asakawa, Yoshifumi; Kinoshita, Seiji; and Ogawa, Kazuhisa, 273,784, Cl. D14-53.000.

Oleksy, Waldyslaw: *See*—
Feinbloom, Richard E.; Lepczynski, Richard; and Oleksy, Waldyslaw, 273,782, Cl. D13-24.000.

Olfman, Jerry A.: *See*—
Olfman, Shawn D.; and Olfman, Jerry A., 273,801, Cl. D21-51.000.

Olfman, Shawn D.; and Olfman, Jerry A. Figurine or statuette of game playing pieces or the like. 273,801, 5-8-84, Cl. D21-51.000.

Owerko, John R., to A.R.F. Products, Inc. Enclosure for a portable handheld transmitter. 273,786, 5-8-84, Cl. D14-95.000.

Pace Collection, Inc., The: *See*—
Rosen, Leon, 273,737, Cl. D6-146.000.
Rosen, Leon, 273,740, Cl. D6-177.000.

Pavlova Pantry Pty. Ltd.: *See*—
Lampe, Deirdre A., 273,766, Cl. D9-352.000.

Pearson, Walter C., to Minnesota Mining and Manufacturing Company. Holder for multiple pads of notepaper. 273,798, 5-8-84, Cl. D19-91.000.

Pelly, Charles W.; and Krieger, John, to Unitek Corporation. Chair. 273,729, 5-8-84, Cl. D6-30.000.

Piaget, Gary: *See*—
Levy, Richard C.; Levy, Sheryl; and Piaget, Gary, 273,774, Cl. D12-112.000.

Pineiro, Hugo A. Foldable seat and table unit. 273,731, 5-8-84, Cl. D6-45.000.

Pota, Joseph. Plastic sheet material for surfacing a wall panel or similar article. 273,811, 5-8-84, Cl. D92-30.000.

Pozzobon, Alessandro, to NORDICA S.p.A. Ski boot. 273,719, 5-8-84, Cl. D2-276.000.

Quiet Designs, Inc.: *See*—
Ronzani, Peter A., 273,721, Cl. D3-35.000.

Ramp, Robert H.: *See*—
Markovitz, Aaron M.; and Ramp, Robert H., 273,794, Cl. D16-112.000.

Rennen, Manfred: *See*—
Luthe, Claus; Rennen, Manfred; and Braun, Hans, 273,773, Cl. D12-92.000.
Luthe, Claus; Rennen, Manfred; and Braun, Hans, 273,780, Cl. D12-190.000.

Rexroth, Thomas A. Patterned lawn trim strip fastening device. 273,756, 5-8-84, Cl. D8-1.000.

Richardson, Olivia. Model church for teaching religious procedures or the like. 273,797, 5-8-84, Cl. D19-62.000.

Richter, Simon J.: *See*—
Sedam, Jason K.; and Richter, Simon J., 273,768, Cl. D9-375.000.

Robert Tiffany Designs, Inc.: *See*—
Tiffany, H. Robert, 273,732, Cl. D6-47.000.

Roecker, David W.: *See*—
Monigle, Glenn W.; and Roecker, David W., 273,790, Cl. D15-9.100.
Monigle, Glenn W.; and Roecker, David W., 273,791, Cl. D15-9.100.

Romberger, Warren O. Necktie fastener. 273,720, 5-8-84, Cl. D2-401.000.

Ronzani, Peter A., to Quiet Designs, Inc. Floppy disk holder. 273,721, 5-8-84, Cl. D3-35.000.

Rosen, Leon, to Pace Collection, Inc., The. Table. 273,737, 5-8-84, Cl. D6-146.000.

Rosen, Leon, to Pace Collection, Inc., The. Wall table. 273,740, 5-8-84, Cl. D6-177.000.

Ruhland, Blue. Guard for a vehicle hitch. 273,778, 5-8-84, Cl. D12-162.000.

Saiger, Herbert C., to Hammock Shop, Inc., The. Chair or similar article. 273,734, 5-8-84, Cl. D6-73.000.

Sakaguchi, Keizaburo, to Sakaguchi Plastic Industrial Co., Ltd. Snap-action clip. 273,762, 5-8-84, Cl. D8-396.000.

Sakaguchi, Keizaburo, to Sakaguchi Plastic Industrial Co., Ltd. Snap-action clip. 273,763, 5-8-84, Cl. D8-396.000.

Sakaguchi Plastic Industrial Co., Ltd.: *See*—
Sakaguchi, Keizaburo, 273,762, Cl. D8-396.000.
Sakaguchi, Keizaburo, 273,763, Cl. D8-396.000.

Sedam, Jason K.; and Richter, Simon J., to Coca-Cola Company, The. Bottle. 273,768, 5-8-84, Cl. D9-375.000.

Sentrol, Inc.: *See*—
Holce, Thomas J.; and Huckins, Charles M., 273,783, Cl. D13-40.000.

Shapiro, Peter D. Work bench. 273,739, 5-8-84, Cl. D6-177.000.

Sharp Corporation: *See*—
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,747, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,748, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,749, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,750, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,751, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,752, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,753, Cl. D7-351.000.
Haruguchi, Kenici; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,754, Cl. D7-351.000.
Yamagami, Masafumi, 273,795, Cl. D18-7.000.

Shibayama, Masato; Abe, Takeshi; Asakawa, Yoshifumi; Kinoshita, Seiji; and Ogawa, Kazuhisa, to Hitachi, Ltd. Telephone. 273,784, 5-8-84, Cl. D14-53.000.

Sidrak, Fahim R. Ruler. 273,769, 5-8-84, Cl. D10-71.000.

Simmons Universal Corporation: *See*—
Cafiero, Vincent, 273,728, Cl. D6-30.000.
Cafiero, Vincent, 273,730, Cl. D6-31.000.

Smith, Eric L. Dental flosser. 273,808, 5-8-84, Cl. D28-64.000.

Steigerwald, Franz; Zulauf, Karlheinz; and Hollwarth, Armin, to Wella AG. Combined bottle and container. 273,764, 5-8-84, Cl. D9-369.000.

Stillace, Vincent. Device for use in parapsychology. 273,812, 5-8-84, Cl. D99-25.000.

Stylette Plastics, Inc.: *See*—
Goetz, Charles R., 273,725, Cl. D4-38.200.

Sun Hill Industries, Inc.: *See*—
Zinbarg, Benson, 273,810, Cl. D28-61.000.

Takei, Isao, to Nichiei Distribution Systems Inc.; and Nippon Kokan Kabushiki Kaisha. Pipe supporting and spacing member. 273,760, 5-8-84, Cl. D8-354.000.

Takei, Isao, to Nichiei Distribution Systems, Inc.; and Nippon Kokan Kabushiki Kaisha. Pipe supporting and spacing member. 273,761, 5-8-84, Cl. D8-354.000.

Termiflex Corporation: *See*—
Ault, Charles M., 273,788, Cl. D14-114.000.

Thorn EMI Limited: *See*—
Chapman, John M.; and Antonis, Basil, 273,809, Cl. D26-3.000.

Thurlow, Heida. Covered frying pan or similar article. 273,755, 5-8-84, Cl. D7-359.000.

Tiffany, H. Robert, to Robert Tiffany Designs, Inc. Lounge seat. 273,732, 5-8-84, Cl. D6-47.000.

Tsujimoto, Kazuo: *See*—
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,747, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,748, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,749, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,750, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,751, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,752, Cl. D7-351.000.
Haruguchi, Kenichi; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,753, Cl. D7-351.000.
Haruguchi, Kenici; Miyake, Takao; Kawaishi, Masayoshi; Numano, Masafumi; and Tsujimoto, Kazuo, 273,754, Cl. D7-351.000.

United States of America
National Aeronautics and Space Administration: *See*—
Cunningham, Jo Ann; Gilliss, Catherine A.; and Gorzo, Patricia M., 273,742, Cl. D6-179.000.
U.S. Philips Corporation: *See*—
Davidson, Grant M. N., 273,785, Cl. D14-73.000.
Unitek Corporation: *See*—
Pelly, Charles W.; and Krieger, John, 273,729, Cl. D6-30.000.
Valenzuela, Luis. Baby bathtub stand. 273,726, 5-8-84, Cl. D6-5.000.
Weiler, Gerhard H., to Automatic Liquid Packaging, Inc. Bottle or the like. 273,767, 5-8-84, Cl. D9-352.000.
Wella AG: *See*—
Steigerwald, Franz; Zulauf, Karlheinz; and Hollwarth, Armin, 273,764, Cl. D9-369.000.
Western Publishing Company: *See*—
Bousman, William J., 273,802, Cl. D21-64.000.
Yamagami, Masafumi, to Sharp Corporation. Electronic calculator. 273,795, 5-8-84, Cl. D18-7.000.
Zimmer, Inc.: *See*—
Bolesky, Richard C.; Cindrich, Nicholas; and Doll, Michael H., 273,806, Cl. D24-28.000.
Zinbarg, Benson, to Sun Hill Industries, Inc. Nail treatment tray. 273,810, 5-8-84, Cl. D28-61.000.
Zulauf, Karlheinz: *See*—
Steigerwald, Franz; Zulauf, Karlheinz; and Hollwarth, Armin, 273,764, Cl. D9-369.000.

LIST OF PLANT PATENTEES

Conard-Pyle Company: *See*—
Zebehazy, Alex J., 5,229, Cl. 54.000.
Hesse, Peter S., to Pan American Plant Company. Chrysanthemum plant named Yellow Limelight. 5,230, 5-8-84, Cl. 74.000.
Pan American Plant Company: *See*—
Hesse, Peter S., 5,230, Cl. 74.000.
Zaiger, Chris F. Nectarine tree—2w68c. 5,228, 5-8-84, Cl. 41.000.
Zebehazy, Alex J., to Conard-Pyle Company. Leucothoe plant—Zebonard variety. 5,229, 5-8-84, Cl. 54.000.

CLASSIFICATION OF PATENTS

ISSUED MAY 8, 1984

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

13 4,446,571
104 4,446,572
252 4,446,573
338 4,446,574
400 4,446,575
425 4,446,576

CLASS 3

1.5 4,446,577
1.91 4,446,578
4,446,579
6 4,446,580
13 4,446,581
4,446,582

CLASS 4

206 4,446,583
237 4,446,584
460 4,446,585
555 4,446,586

CLASS 5

83 4,446,587

CLASS 7

138 4,446,588

CLASS 8

116.4 4,447,241
128 R 4,447,242
188 4,447,243
514 4,447,244

CLASS 15

250.32 4,446,589
302 4,446,590
315 4,446,591
316 R 4,446,592
322 4,446,593
323 4,446,594
365 4,446,595

CLASS 16

333 4,446,596
364 4,446,597

CLASS 17

1 B 4,446,598
4,446,599
11 4,446,600
51 4,446,601

CLASS 18

661 4,447,771

CLASS 19

0.21 4,446,602

CLASS 24

21 4,446,603
68 J 4,446,604
277 4,446,605

CLASS 26

18.6 4,446,606

CLASS 29

33 E 4,446,607
220 4,446,608
270 4,446,609
421 E 4,446,610
568 4,446,612
571 4,446,613
578 4,446,611
622 4,446,614
742 4,446,615
775 4,446,616
861 4,446,617
882 4,446,618

CLASS 30

85 4,446,619
96 4,446,620
229 4,446,623
241 4,446,621
272 R 4,446,622

CLASS 33

1 C 4,446,624
184.5 4,446,625
286 4,446,626
366 4,446,628
497 4,446,627

CLASS 34

57 A 4,446,629
65 4,446,630
4,446,631
103 4,446,632

CLASS 36

11.5 4,446,633
29 4,446,634
116 4,446,635

CLASS 37

54 4,446,636
55 4,446,637
142 A 4,446,638
280 4,446,639

CLASS 40

16.2 4,446,640
152 4,446,641
152.1 4,446,642
590 4,446,643

CLASS 42

1 ST 4,446,644
50 4,446,645

CLASS 43

12 4,446,646
36 4,446,647
131 4,446,648

CLASS 44

1 SR 4,447,245

CLASS 46

218 4,446,649
1 F 4,447,250

CLASS 47

1.5 4,446,650
10 4,446,651
66 4,446,652
67 4,446,653

CLASS 49

181 4,446,654
368 4,446,655

CLASS 51

7 4,446,656
206 R 4,446,657

CLASS 52

9 4,446,659
11 4,446,658
36 4,446,660
95 4,446,661
121 4,446,662
144 4,446,663
404 4,446,664
407 4,446,665
648 4,446,666
658 4,446,667
729 4,446,668
738 4,446,669

CLASS 53

244 4,446,670
445 4,446,671
448 4,446,672
467 4,446,673
502 4,446,674
535 4,446,675
552 4,446,676
577 4,446,677

CLASS 55

55 4,447,247

CLASS 56

1 4,446,678
2 4,446,679
11.9 4,446,680
16.7 4,446,681
119 4,446,682
296 4,446,683
341 4,446,684
377 4,446,685

CLASS 57

6 4,446,686
22 4,446,687
58.65 4,446,688
204 4,446,689
284 4,446,690
4,446,691

CLASS 60

39.182 4,446,694
39.23 4,446,692
39.32 4,446,693
200.1 4,446,695
226.3 4,446,696
443 4,446,697
520 4,446,698
547.1 4,446,699
641.8 4,446,700

CLASS 62

6 4,446,701
55.5 4,446,702
113 4,446,703
180 4,446,704
372 4,446,705

CLASS 65

2 4,447,248
4.4 4,447,249
142 4,447,251
268 4,447,252

CLASS 68

24 4,446,706

CLASS 70

134 4,446,707
166 4,446,708
363 4,446,709

CLASS 71

28 4,447,253
67 4,447,254
86 4,447,255
4,447,256
91 4,447,257
93 4,447,258
94 4,447,259
118 4,447,260

CLASS 72

10 4,446,710
213 4,446,711
243 4,446,712
308 4,446,713
370 4,446,714

CLASS 73

1 DC 4,446,716
1 R 4,446,715
7 4,446,717
23 4,446,718
4,446,719
4,446,720
29 4,446,721
35 4,446,722
4,446,723
4,446,724
61 R 4,446,725
61.4 4,446,726
113 4,446,727
116 4,446,728
178 R 4,446,729
301 4,446,730
334 4,446,731
461 4,446,732
579 4,446,733
586 4,446,734
597 4,446,735
600 4,446,736
602 4,446,737
606 4,446,738
609 4,446,739
626 4,446,740
654 4,446,741
663 4,446,742
822 4,446,743
861.28 4,446,744
862.25 4,446,745
862.33 4,446,746
862.58 4,446,747
863.03 4,446,748
863.23 4,446,749

CLASS 74

1.5 4,446,750
422 4,446,751
462 4,446,752
594.1 4,446,753
594.3 4,446,754
606 R 4,446,755
687 4,446,756
758 4,446,757
781 R 4,446,758
867 4,446,759

CLASS 75

5 4,447,261
65 R 4,447,262
233 4,447,263
251 4,447,264
257 4,447,265

CLASS 76

79 4,446,760

CLASS 81

57.19 4,446,761
57.39 4,446,762
90 B 4,446,763
170 4,446,764
441 4,446,765
480 4,446,766

CLASS 83

136 4,446,767
879 4,446,768

CLASS 84

1.01 4,446,769
4,446,770

CLASS 89

14 SB 4,446,771
37 E 4,446,772

CLASS 91

317 4,446,773
369 B 4,447,897

CLASS 98

38 D 4,446,774

CLASS 99

353 4,446,775
401 4,446,776
419 4,446,777
455 4,446,778
472 4,446,779
480 4,446,780
483 4,446,781
589 4,446,782

CLASS 100

5 4,446,783
27 4,446,784
35 4,446,785
88 4,446,786
99 4,446,787
117 4,446,788

CLASS 101

93.04 4,446,789
93.14 4,446,790
122 4,446,791

CLASS 102

473 4,446,792
505 4,446,793
513 4,446,794
527 4,446,795

CLASS 106

90 4,447,266
93 4,447,267
148 4,447,268
277 4,447,269
300 4,447,270
4,447,271

CLASS 108

69 4,446,796

CLASS 109

53 4,446,797
61 4,446,798

CLASS 110

263 4,446,799
270 4,446,800

CLASS 111

86 4,446,801

CLASS 112

121.12 4,446,802
320 4,446,803

CLASS 114

74 R 4,446,804
76 4,446,805
219 4,446,806
230 4,446,807
248 4,446,808

CLASS 116

28.1 4,446,809
307 4,446,810
309 4,446,811

CLASS 118

63 4,446,812
72 4,446,813
694 4,446,814
718 4,446,815
4,446,816
725 4,446,817

CLASS 119

52 AF 4,446,818
97 R 4,446,819

CLASS 122

32 4,446,820

CLASS 123

26 4,446,821
41.31 4,446,822
52 M 4,446,824
52 MB 4,446,823
90.65 4,446,825
143 B 4,446,826
195 R 4,446,827
196 R 4,446,828
244 4,446,829
276 4,446,830
286 4,446,831
339 4,446,832
435 4,446,833
440 4,446,834
450 4,446,835
4,446,836
460 4,446,837
520 4,446,838
569 4,446,839
571 4,446,840
602 4,446,841
606 4,446,842
609 4,446,843

CLASS 124

41 A 4,446,844

CLASS 125

13 SS 4,446,845

CLASS 126

25 R 4,446,846
120 4,446,847
121 4,446,848
299 R 4,446,849
431 4,446,850
432 4,446,852
449 4,446,851
450 4,446,853
451 4,446,854

CLASS 128

24.2 4,446,855
80 R 4,446,856
92 BC 4,446,857
94 4,446,858
132 R 4,446,860
139 4,446,861
203.15 4,446,862
204.18 4,446,863
204.26 4,446,859
207.14 4,446,864
321 4,446,865
340 4,446,866
344 4,446,867
422 4,446,870
633 4,446,871
700 4,446,872
708 4,446,868
715 4,446,873
716 4,446,869
804 4,446,874

CLASS 130

27 JT 4,446,875

CLASS 131

110 4,446,876
198 R 4,446,877
336 4,446,878

CLASS 132

82 B 4,446,879
88.5 4,446,880

CLASS 137

1 4,446,881
87 4,446,890
115 4,446,882
315 4,446,883
355.23 4,446,884
360 4,446,885
516.29 4,446,886
556 4,446,887
596.17 4,446,888
625.4 4,446,889

CLASS 138

97 4,446,891
104 4,446,892

CLASS 139

11 4,446,893

CLASS 140

57 4,446,894

CLASS 141

4 4,446,895
198 4,446,896

CLASS 144

34 R 4,446,897
57 4,447,246
193 A 4,446,898
201 4,446,899

CLASS 148

1.5 4,447,272
6.15 R 4,447,273
6.24 4,447,274
152 4,447,275
175 4,447,276
400 4,447,277

CLASS 149

19.91 4,447,278

CLASS 150

52 R 4,446,900

CLASS 152

209 B 4,446,902
209 R 4,446,901
323 4,446,903
356 R 4,446,904
361 DM 4,446,905

CLASS 156

61 4,447,279
85 4,447,280
250 4,447,281
285 4,447,282
325 4,447,283
366 4,447,284
473 4,447,285
515 4,447,286
552 4,447,287
574 4,447,288
608 4,447,289
626 4,447,290
643 4,447,291
644 4,447,292

CLASS 159

6.2 4,447,293

CLASS 162

158 4,447,294
300 4,447,295
312 4,447,296

CLASS 164

112 4,446,906
120 4,446,907
452 4,446,908

453 4,446,909

CLASS 165

1 4,446,910
4 4,446,911
12 4,446,912
4,446,913
129 4,446,914
144 4,446,915
185 4,446,916

CLASS 166

59 4,446,917
245 4,446,918
246 4,446,919
267 4,446,921
297 4,446,920
322 4,446,922

CLASS 169

45 4,446,923

CLASS 172

140 4,446,924
142 4,446,925
240 4,446,926
753 4,446,927
776 4,446,928

CLASS 173

17 4,446,929
29 4,446,930
48 4,446,931

CLASS 174

15 CA 4,447,670
28 4,447,671

CLASS 175

74 4,446,932
229 4,446,933
286 4,446,934
329 4,446,935
410 4,446,936

CLASS 177

1 4,446,937
25 4,446,938

CLASS 178

22.19 4,447,672

CLASS 179

18 HB 4,447,673
81 R 4,447,674
84 R 4,447,675
90 BD 4,447,676
107 R 4,447,677
115.5 PS 4,447,678
175.3 R 4,447,679

CLASS 180

89.15 4,446,939
177 4,446,940
236 4,446,941

CLASS 181

249 4,446,942

CLASS 182

3 4,446,943
4,446,944
229 4,446,945

CLASS 187

29 R 4,446,946

CLASS 188

73.34 4,446,947
73.45 4,446,948
79.5 K 4,446,949

CLASS 191

48 4,447,680

CLASS 192

3 TR 4,446,950
4 A 4,446,951
58 B 4,446,952
70.12 4,446,953
105 CD 4,446,954
106.2 4,446,955

CLASS 194

1 L 4,446,956
54 4,446,957

CLASS 198

311 4,446,958
382 4,446,959
408 4,446,960
443 4,446,961
457 4,446,962
735 4,446,963

CLASS 200

5 A 4,447,681
50 AA 4,447,682
61.27 4,447,683
61.54 4,447,684

67 D 4,447,685
153 J 4,447,686
159 R 4,447,687
4,447,688
330 4,447,689

CLASS 202

99 4,447,297

CLASS 204

23 4,447,298
43 R 4,447,299
67 4,447,300
4,447,301
128 4,447,302
157.1 R 4,447,303
4,447,304
192 C 4,447,305
224 R 4,447,306
267 4,447,307
279 4,447,308
402 4,447,309

CLASS 206

205 4,446,965
321 4,446,964
334 4,446,966
368 4,446,967
451 4,446,968
519 4,446,969
569 4,446,970
607 4,446,971

CLASS 208

8 LE 4,447,310
35 4,447,311
46 4,447,312
86 4,447,313
89 4,447,314
99 4,447,315
138 4,447,316
216 R 4,447,317
348 4,447,318

CLASS 209

11 4,447,319
273 4,447,320

CLASS 210

86 4,447,321
104 4,447,322
158 4,447,323
159 4,447,324
295 4,447,325
321.3 4,447,326
350 4,447,327
635 4,447,328
673 4,447,329
717 4,447,330
721 4,447,331
748 4,447,332
750 4,447,333
783 4,447,334

CLASS 211

13 4,446,972
45 4,446,973
4,446,974

CLASS 212

188 4,446,975
189 4,446,976
247 4,446,977

CLASS 215

13 R 4,446,978
203 4,446,979
276 4,446,980
354 4,446,981

CLASS 219

10.43 4,447,690
10.49 R 4,447,691
10.55 B 4,447,692
10.55 M 4,447,693
68 4,447,694
69 C 4,447,695
69 G 4,447,713
69 P 4,447,696
86.41 4,447,697
110 4,447,698
4,447,699
117.1 4,447,700
121 LG 4,447,701
130.33 4,447,702
136 4,447,703
216 4,447,704
222 4,447,705
299 4,447,706
301 4,447,707
384 4,447,708
4,447,709
449 4,447,710
464 4,447,711
486 4,447,712

CLASS 220

8 4,446,982

219 4,446,983
268 4,446,984
269 4,446,985
307 4,446,986

CLASS 222

63 4,446,988
81 4,446,989
82 4,446,990
89 4,446,987
94 4,446,991
196 4,446,992
214 4,446,993
475 4,446,994
590 4,446,995

CLASS 223

96 4,446,996

CLASS 224

151 4,446,997
329 4,446,998

CLASS 227

11 4,446,999
49 4,447,000

CLASS 228

37 4,447,001

CLASS 229

37 R 4,447,002
44 CB 4,447,003
52 B 4,447,004

CLASS 232

35 4,447,005

CLASS 235

379 4,447,714
454 4,447,715
492 4,447,716

CLASS 238

341 4,447,006

CLASS 239

165 4,447,007
214.13 4,447,008
265.39 4,447,009
414 4,447,010

CLASS 241

37 4,447,011

CLASS 242

54 R 4,447,012
4,447,013
55 4,447,014
55.2 4,447,015
56.9 4,447,016
107.2 4,447,018
107.4 A 4,447,017
192 4,447,019
198 4,447,020
199 4,447,021

CLASS 244

13 4,447,022
17.11 4,447,023
23 A 4,447,024
118.2 4,447,025
129.5 4,447,026
212 4,447,027
4,447,028

CLASS 248

27.1 4,447,030
246 4,447,029
280.1 4,447,031
558 4,447,032
563 4,447,033
634 4,447,034

CLASS 249

194 4,447,035

CLASS 250

201 4,447,717
203 R 4,447,718
204 4,447,719
211 J 4,447,720
213 VT 4,447,721
216 4,447,722
236 4,447,723
309 4,447,724
339 4,447,725
342 4,447,726
390 4,447,727
423 R 4,447,728
427 4,447,732
442.1 4,447,731
506.1 4,447,729
4,447,730
4,447,733
517.1 4,447,734
578 4,447,735

CLASS 251

1 B 4,447,037
4,447,038
63.4 4,447,036
144 4,447,039
149.8 4,447,040

CLASS 252

1 4,447,335
7 4,447,336
4,447,337
8.5 A 4,447,339
4,447,341
8.5 C 4,447,340
8.5 M 4,447,338
8.55 D 4,447,342
8.75 4,447,343
60 4,447,344
62 4,447,345
62.2 4,447,346
70 4,447,347
75 4,447,348
174.13 4,447,349
301.22 4,447,350
313 R 4,447,351
519 4,447,352
630 4,447,353

CLASS 254

9 R 4,447,041
90 4,447,042
269 4,447,043
309 4,447,044

CLASS 260

106 4,447,354
112 B 4,447,355
112.5 R 4,447,356
153 4,447,357
205 4,447,358
207 4,447,359
239 A 4,447,360
244.4 4,447,361
396 R 4,447,362
397.3 4,447,363
448 R 4,447,364
463 4,447,365
501.11 4,447,366
502.4 R 4,447,367
508 4,447,368
665 R 4,447,369

CLASS 261

35 4,447,370
44 E 4,447,371

CLASS 264

2.2 4,447,372
4 4,447,373
8 4,447,383
22 4,447,374
40.5 4,447,375
42 4,447,376
45.2 4,447,377
45.9 4,447,378
61 4,447,379
82 4,447,380
107 4,447,381
123 4,447,382
206 4,447,384
315 4,447,385
328.2 4,447,386
566 4,447,387

CLASS 266

149 4,447,045
216 4,447,046

CLASS 267

118 4,447,047
141.1 4,447,048

CLASS 269

46 4,447,049
49 4,447,050
302.1 4,447,051

CLASS 271

113 4,447,053
280 4,447,052
311 4,447,054

CLASS 272

113 4,447,055

CLASS 273

55 R 4,447,056
116 4,447,057
121 A 4,447,058
176 FA 4,447,059
346 4,447,060

CLASS 277

1 4,447,061
3 4,447,062
80 4,447,063
134 4,447,064
184 4,447,065

212 FB 4,447,066

CLASS 280

153 R 4,447,067
260 4,447,068
270 4,447,069
434 4,447,070
479 R 4,447,071
492 4,447,072
705 4,447,073
804 4,447,074

CLASS 285

55 4,447,076
104 4,447,077
331 4,447,078
363 4,447,079

CLASS 290

1 R 4,447,736
6 4,447,737
44 4,447,738
52 4,447,739
53 4,447,740

CLASS 292

264 4,447,080
4,447,081

CLASS 294

1 BA 4,447,082
66 R 4,447,083
83 AE 4,447,084
97 4,447,085

CLASS 296

217 4,447,086

CLASS 297

130 4,447,087
217 4,447,088

CLASS 298

11 4,447,089

CLASS 299

2 4,447,090

CLASS 301

37 AT 4,447,091
37 P 4,447,092
63 PW 4,447,093

CLASS 307

31 4,447,741
106 4,447,742
118 4,447,743
252 R 4,447,744
269 4,447,745
311 4,447,746
529 4,447,747

CLASS 308

2 R 4,447,094
3.8 4,447,095

CLASS 310

11 4,447,748
71 4,447,749
89 4,447,750
154 4,447,751
232 4,447,752
312 4,447,753
313 R 4,447,754
329 4,447,755

CLASS 312

111 4,447,096
215 4,447,097
216 4,447,098
257 R 4,447,099

CLASS 313

487 4,447,756
509 4,447,757
532 4,447,758

CLASS 315

60 4,447,759
65 4,447,760
111.81 4,447,761
116 4,447,762
207 4,447,763
240 4,447,764
4,447,765
241 R 4,447,766

CLASS 318

139 4,447,767
293 4,447,768
564 4,447,769
618 4,447,770
799 4,447,784
803 4,447,787
811 4,447,786

CLASS 320

25 4,447,785

CLASS 323

226 4,447,784
275 4,447,783

CLASS 324

56 4,447,782
83 A 4,447,781
132 4,447,780
207 4,447,779
213 4,447,778
220 4,447,777
253 4,447,776
438 4,447,775

CLASS 328

150 4,447,774
233 4,447,773

CLASS 329

126 4,447,772

CLASS 330

4.3 4,447,789
149 4,447,790
297 4,447,791

CLASS 332

19 4,447,792

CLASS 333

106 4,447,793

CLASS 335

128 4,447,794

CLASS 336

60 4,447,796
178 4,447,795
205 4,447,797

CLASS 338

22 R 4,447,799

CLASS 339

14 R 4,447,100
45 M 4,447,101
91 R 4,447,102
94 M 4,447,103
103 M 4,447,104
113 R 4,447,105
126 R 4,447,106
171 E 4,447,107
256 R 4,447,109
256 RT 4,447,108
262 RR 4,447,110

CLASS 340

52 F 4,447,801
119 4,447,802
347 CC 4,447,803
347 DD 4,447,804
539 4,447,805
641 4,447,806
676 4,447,807
696 4,447,808
747 4,447,809
756 4,447,810
784 4,447,812
825.1 4,447,813
904 4,447,800

CLASS 343

401 4,447,814
754 4,447,815
783 4,447,811
877 4,447,816

CLASS 346

75 4,447,817
76 PH 4,447,818
4,447,819
140 R 4,447,820
154 4,447,821
200 4,447,487
213 4,447,075

CLASS 350

3.7 4,447,111
6.5 4,447,112
96.13 4,447,116
96.15 4,447,117
96.16 4,447,118
96.18 4,447,119
96.2 4,447,114
4,447,115
96.20 4,447,120
4,447,121
96.23 4,447,122
96.24 4,447,123
96.30 4,447,124
4,447,125
96.31 4,447,126
96.33 4,447,127
174 4,447,128
302 4,447,129
310 4,447,130
333 4,447,131

346 4,447,132
357 4,447,133
358 4,447,134
426 4,447,135
432 4,447,136
454 4,447,137
472 4,447,138
522 4,447,139
534 4,447,140

CLASS 351

237 4,447,141

CLASS 354

246 4,447,142
407 4,447,143

CLASS 355

3 BE 4,447,144
14 D 4,447,145
28 4,447,146
51 4,447,147
75 4,447,148

CLASS 356

5 4,447,149
41 4,447,150
218 4,447,151
237 4,447,152
361 4,447,153
404 4,447,154
437 4,447,155

CLASS 357

17 4,447,822
23 4,447,823
71 4,447,824
4,447,825

CLASS 358

27 4,447,826
75 4,447,113
111 4,447,827
118 4,447,828
260 4,447,829
283 4,447,830
4,447,831
296 4,447,832
298 4,447,833
310 4,447,834

CLASS 360

10.2 4,447,835
15 4,447,836
33.1 4,447,837
96.5 4,447,838
113 4,447,839
137 4,447,840

CLASS 361

18 4,447,841
76 4,447,843
77 4,447,844
80 4,447,845
90 4,447,846
117 4,447,847
124 4,447,848
152 4,447,849
172 4,447,850
189 4,447,851
306 4,447,852
321 4,447,853
4,447,855
329 4,447,854
383 4,447,856
386 4,447,842
395 4,447,857
429 4,447,858

CLASS 362

13 4,447,859
30 4,447,860
199 4,447,863
216 4,447,861
267 4,447,862
305 4,447,865
311 4,447,864

CLASS 363

21 4,447,866
56 4,447,867
81 4,447,868

CLASS 364

184 4,447,869
200 4,447,870
4,447,871
4,447,872
4,447,873
4,447,874
4,447,875
4,447,876
4,447,877
4,447,878
4,447,879
431.04 Re.31,582
431.05 4,447,880
488 4,447,881
521 4,447,882
555 4,447,883
557 4,447,884
568 4,447,885
725 4,447,886
900 4,447,887
4,447,888
4,447,889
4,447,890

CLASS 365

154 4,447,891
156 4,447,892
203 4,447,893
219 4,447,894
226 4,447,895

CLASS 366

80 4,447,156
137 4,447,157
297 4,447,158

CLASS 367

96 4,447,896

CLASS 368

23 4,447,159
34 4,447,160
65 4,447,161
295 4,447,162
319 4,447,163

CLASS 369

65 4,447,898
111 4,447,899
200 4,447,900

CLASS 370

74 4,447,901

CLASS 371

39 4,447,902
68 4,447,903

CLASS 372

45 4,447,904
46 4,447,905

CLASS 373

72 4,447,906

CLASS 374

162 4,447,164

CLASS 375

1 4,447,907
42 4,447,908
88 4,447,909
99 4,447,910

CLASS 376

245 4,447,388
364 Re.31,583

CLASS 377

55 4,447,798

CLASS 384

428 4,447,165

CLASS 400

124 4,447,166
625 4,447,167
708 4,447,168

CLASS 401

269 4,447,169

CLASS 403

64 4,447,170
381 4,447,171

CLASS 404

68 4,447,172

CLASS 405

181 4,447,173
293 4,447,174

CLASS 407

114 4,447,175

CLASS 408

72 R 4,447,176
161 4,447,177

CLASS 409

80 4,447,178
127 4,447,179
232 4,447,180
345 4,447,181

CLASS 411

45 4,447,182
57 4,447,183

CLASS 413

26 4,447,184

CLASS 414

420 4,447,185
589 4,447,186
730 Re.31,581

CLASS 415

53 R 4,447,187
115 4,447,188
168 4,447,189

CLASS 416

95 4,447,190

CLASS 417

12 4,447,191
360 4,447,192
441 4,447,193
570 4,447,195
572 4,447,194

CLASS 418

93 4,447,196

CLASS 419

6 4,447,389
49 4,447,390

CLASS 420

456 4,447,391
501 4,447,392
590 4,447,393

CLASS 422

27 4,447,394
68 4,447,395
73 4,447,396
94 4,447,397
102 4,447,398
113 4,447,399
150 4,447,400
151 4,447,401
174 4,447,402

CLASS 423

20 4,447,403
61 4,447,404
88 4,447,405
198 4,447,406
262 4,447,407
300 4,447,408
416 4,447,409
655 4,447,410

CLASS 424

14 4,447,411
16 4,447,412
78 4,447,413
81 4,447,414
101 4,447,415
4,447,416
156 4,447,417
165 4,447,418
177 4,447,419
210 4,447,420
227 4,447,421
229 4,447,422
234 4,447,423
238 4,447,424
241 4,447,425
243 4,447,426
244 4,447,427
4,447,428
246 4,447,429
4,447,430
4,447,431
248.54 4,447,432
250 4,447,433
256 4,447,434
258 4,447,435
4,447,436
263 4,447,437
267 4,447,438
4,447,439
269 4,447,440
4,447,441
273 P 4,447,442
4,447,444
273 R 4,447,443
279 4,447,445
282 4,447,446
285 4,447,447
4,447,448
304 4,447,449
4,447,450
317 4,447,451
319 4,447,452
4,447,453
330 4,447,454
331 4,447,455

CLASS 425

28 R 4,447,197
140 4,447,198
182 4,447,199
388 4,447,200
397 4,447,201
434 4,447,202

CLASS 426

51 4,447,456
91 4,447,457
275 4,447,458
441 4,447,459
541 4,447,460
589 4,447,461
601 4,447,462
603 4,447,463
663 4,447,464

CLASS 427

10 4,447,465
34 4,447,466
48 4,447,467
54.1 4,447,468
4,447,469
76 4,447,470
98 4,447,471
120 4,447,472
162 4,447,473
164 4,447,474
213.31 4,447,475
215 4,447,476
388.3 4,447,477
407.1 4,447,478

CLASS 428

35 4,447,479
4,447,480
40 4,447,481
42 4,447,482
105 4,447,483
137 4,447,484
144 4,447,485
213 4,447,488
225 4,447,489
285 4,447,490
304.4 4,447,491
318.6 4,447,486
328 4,447,492
332 4,447,493
349 4,447,494
429 4,447,495
432 4,447,496
446 4,447,497
447 4,447,498
4,447,499
489 4,447,500
570 4,447,501
571 4,447,502
632 4,447,503

CLASS 429

9 4,447,504
42 4,447,505
44 4,447,506
54 4,447,507
57 4,447,508
235 4,447,509

CLASS 430

3 4,447,510
15 4,447,511
17 4,447,512
58 4,447,513
81 4,447,514
83 4,447,515
109 4,447,516
122 4,447,517
4,447,518
275 4,447,519
281 4,447,520
337 4,447,521
405 4,447,522
505 4,447,523
538 4,447,524
539 4,447,525

CLASS 431

3 4,447,203
76 4,447,204
328 4,447,205

CLASS 433

27 4,447,206
69 4,447,207
166 4,447,208
173 4,447,209
4,447,210

CLASS 434

12 4,447,211
185 4,447,212
201 4,447,213

CLASS 435

7 4,447,526
4,447,527
4,447,528
4,447,529
68 4,447,530
94 4,447,531
99 4,447,532
119 4,447,533
161 4,447,534
162 4,447,535
188 4,447,536
235 4,447,537
253 4,447,538
4,447,539
254 4,447,540
264 4,447,541

CLASS 436

66 4,447,542
72 4,447,543
105 4,447,544
518 4,447,545
527 4,447,546
543 4,447,547

CLASS 440

66 4,447,214
71 4,447,215

CLASS 445

70 4,447,216

CLASS 464

32 4,447,217

CLASS 493

251 4,447,218
410 4,447,219

CLASS 494

26 4,447,220
45 4,447,221

CLASS 501

75 4,447,550
85 4,447,548
138 4,447,549

CLASS 502

36 4,447,553
37 4,447,551
41 4,447,552
73 4,447,554
74 4,447,555
4,447,556
161 4,447,557
215 4,447,558

CLASS 521

28 4,447,559
68 4,447,560
118 4,447,561

CLASS 523

105 4,447,562
176 4,447,563
200 4,447,564
219 4,447,565
221 4,447,566
501 4,447,567

CLASS 524

101 4,447,568
109 4,447,569
127 4,447,570
192 4,447,571
371 4,447,572
394 4,447,573
400 4,447,574
484 4,447,575
714 4,447,576
845 4,447,577

CLASS 525

75 4,447,578
113 4,447,579
121 4,447,580
189 4,447,581
279 4,447,582
328.1 4,447,583
340 4,447,584
359.2 4,447,585
504 4,447,586

CLASS 526

124 4,447,587
301 4,447,588

CLASS 528

45 4,447,589
76 4,447,590
80 4,447,591
128 4,447,592
176 4,447,593
245 4,447,594
274 4,447,595
353 4,447,596
388 4,447,597
489 4,447,598
502 4,447,599

CLASS 536

23 4,447,600
102 4,447,601

CLASS 544

21 4,447,602
184 4,447,603
219 4,447,604
225 4,447,605
231 4,447,606
246 4,447,607
287 4,447,608
317 4,447,609
381 4,447,610

CLASS 544

118 4,447,611
285 4,447,612
300 4,447,613
316 4,447,614
317 4,447,615
335 4,447,616

CLASS 548

164 4,447,617
170 4,447,618
318 4,447,619
336 4,447,620
342 4,447,621
525 4,447,622

CLASS 549

36 4,447,623
69 4,447,624
265 4,447,625
292 4,447,626
548 4,447,627

CLASS 556

415 4,447,628
419 4,447,629
460 4,447,630
469 4,447,631
470 4,447,632
479 4,447,633

CLASS 560

13 4,447,634
115 4,447,635
122 4,447,636
124 4,447,637
204 4,447,638
4,447,639
207 4,447,640
211 4,447,641
247 4,447,642
248 4,447,643

CLASS 562

406 4,447,644
473 4,447,645
487 4,447,646

CLASS 564

412 4,447,647

CLASS 568

484 4,447,648
4,447,649
640 4,447,650
645 4,447,651
658 4,447,652
697 4,447,653
708 4,447,654
724 4,447,655
730 4,447,656
750 4,447,658
774 4,447,660
783 4,447,657
876 4,447,659
882 4,447,661
939 4,447,662

CLASS 570

150 4,447,663

CLASS 585

323 4,447,664
379 4,447,665
467 4,447,666
469 4,447,667
639 4,447,668
640 4,447,669

CLASS 604

15 4,447,222
61 4,447,223
67 4,447,224
71 4,447,225
73 4,447,226
95 4,447,227
103 4,447,228
111 4,447,229
122 4,447,230
131 4,447,231
134 4,447,232
151 4,447,234
152 4,447,233
169 4,447,235
4,447,236
175 4,447,237
280 4,447,238
282 4,447,239
385 4,447,240

CLASSIFICATION OF DESIGNS

-D2—	276	273,719		114	273,735			273,751		369	273,764	D14—	53	273,784	D20—	11	273,799
	401	273,720		130	273,736			273,752		375	273,768		73	273,785	D21—	13	273,800
D3—	35	273,721		146	273,737			273,753	D10—	71	273,769		95	273,786		51	273,801
	65	273,722		175	273,738			273,754	D11—	34	273,771		101	273,787		64	273,802
D4—	15	273,723		177	273,739		359	273,755		35	273,772		114	273,788		234	273,803
	25	273,724			273,740	D8—	1	273,756	D12—	92	273,773	D15—	9	273,789	D23—	127	273,804
	38.2	273,725		178	273,741		18	273,757		112	273,774		9.1	273,790	D24—	10	273,805
D6—	5	273,726		179	273,742		71	273,758		114	273,775			273,791		28	273,806
	7	273,727		191	273,743		75	273,759		128	273,776		27	273,792		56	273,807
	30	273,728		234	273,744		354	273,760		147	273,777		150	273,793	D26—	3	273,809
		273,729	D7—	9	273,745			273,761		162	273,778	D16—	112	273,794	D28—	61	273,810
	31	273,730		76	273,746		396	273,762		182	273,779	D18—	7	273,795		64	273,808
	45	273,731		351	273,747			273,763		190	273,780	D19—	27	273,796	D92—	30	273,811
	47	273,732			273,748	D9—	341	273,765		211	273,781		62	273,797	D99—	25	273,812
	57	273,733			273,749		352	273,766	D13—	24	273,782		91	273,798		28	273,813
	73	273,734			273,750			273,767		40	273,783						

CLASSIFICATION OF PLANTS

P.—	41	5,228		54	5,229		74	5,230									

GEOGRAPHICAL INDEX

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

6 : 4,446,933
4,447,336
4,447,392
4,447,598

9 : 4,446,653
4,447,726

01 : 4,446,590
4,446,853
4,447,674
4,447,846

04 : 4,446,831
4,446,843
4,447,050
4,447,107
4,447,126
4,447,173
4,447,219
4,447,307
4,447,772
4,447,841
4,447,907

06 : 4,446,571
4,446,572
4,446,581
4,446,586
4,446,587
4,446,588
4,446,598
4,446,599
4,446,613
4,446,615
4,446,624
4,446,633
4,446,648
4,446,649
4,446,695
4,446,698
4,446,703
4,446,707
4,446,708
4,446,715
4,446,733
4,446,740
4,446,750
4,446,757
4,446,761
4,446,769
4,446,779
4,446,793
4,446,798
4,446,810
4,446,846
4,446,866
4,446,870
4,446,877
4,446,894
4,446,896
4,446,916
4,446,959
4,446,973
4,446,980
4,446,983
4,447,001
4,447,012
4,447,019
4,447,037
4,447,040
4,447,049
4,447,068
4,447,069
4,447,085
4,447,088
4,447,091
4,447,120
4,447,128
4,447,150
4,447,169
4,447,183
4,447,186
4,447,203
4,447,218
4,447,225
4,447,229
4,447,233
4,447,234
4,447,238
4,447,253
4,447,257
4,447,262
4,447,290
4,447,316
4,447,317
4,447,337
4,447,353
4,447,391
4,447,398
4,447,407
4,447,441
4,447,445
4,447,450
4,447,456
4,447,469
4,447,470
4,447,492
4,447,497
4,447,519

08 : 4,446,577
4,446,752
4,446,771
4,446,854
4,446,903
4,446,944
4,447,051
4,447,090
4,447,144
4,447,547

09 : Re.31,583
4,446,622
4,446,668
4,446,672
4,446,829
4,446,908
4,446,909
4,446,984
4,446,990
4,446,997
4,447,101
4,447,148
4,447,159
4,447,506
4,447,531
4,447,682
4,447,697
4,447,701
4,447,705
4,447,712
4,447,890

10 : 4,447,411
4,447,495
4,447,592
4,447,527
4,447,538
4,447,546
4,447,548
4,447,613
4,447,662
4,447,721
4,447,723
4,447,727
4,447,728
4,447,732
4,447,737
4,447,773
4,447,783
4,447,784
4,447,835
4,447,866
4,447,878
4,447,904

12 : 4,446,578
4,446,585
4,446,680
4,446,749
4,446,754
4,446,763
4,446,855
4,446,950
4,446,956
4,446,972
4,447,009
4,447,035
4,447,084
4,447,176
4,447,200
4,447,215
4,447,222
4,447,235
4,447,236
4,447,288
4,447,423
4,447,673
4,447,804
4,447,814
4,447,910

13 : 4,446,686
4,446,689
4,446,712
4,446,890
4,446,974
4,446,989
4,447,369
4,447,484
4,447,707

16 : 4,447,170

17 : 4,447,403
4,446,607
4,446,614
4,446,631
4,446,642
4,446,659
4,446,669
4,446,709
4,446,711
4,446,726
4,446,734
4,446,751
4,446,758
4,446,784
4,446,785
4,446,811
4,446,859
4,447,628

18 : 4,446,873
4,446,924
4,446,953
4,446,957
4,446,963
4,446,966
4,446,967
4,446,981
4,447,004
4,447,058
4,447,080
4,447,082
4,447,105
4,447,119
4,447,191
4,447,198
4,447,214
4,447,227
4,447,228
4,447,250
4,447,287
4,447,301
4,447,315
4,447,329
4,447,344
4,447,351
4,447,371
4,447,406
4,447,420
4,447,471
4,447,480
4,447,500
4,447,552
4,447,556
4,447,574
4,447,641
4,447,645
4,447,652
4,447,653
4,447,657
4,447,665
4,447,688
4,447,699
4,447,859
4,447,863
4,446,654
4,446,770
4,446,818
4,446,979
4,446,987
4,446,998
4,447,005
4,447,008
4,447,065

19 : 4,446,684
4,446,685
4,446,900
4,446,976
4,447,055
4,447,463
4,447,532

20 : 4,446,927
4,447,034
4,447,071
4,447,158
4,447,193
4,447,565

21 : 4,446,650
4,446,878
4,446,928
4,447,586
4,447,659

22 : 4,446,610
4,446,808
4,446,932
4,446,977
4,447,076
4,447,330
4,447,408
4,447,582
4,447,740

23 : 4,447,156

24 : 4,446,635
4,446,646
4,446,774
4,446,845
4,446,864
4,446,968
4,447,059
4,447,123
4,447,341
4,447,395
4,447,416
4,447,427
4,447,743
4,447,749
4,447,776
4,447,786
4,447,265
4,447,364
4,447,412
4,447,454
4,447,472
4,447,526
4,447,529
4,447,542
4,447,692

4,447,873
4,447,886
25 : 4,446,619
4,446,637
4,446,702
4,446,717
4,446,747
4,446,790
4,446,799
4,446,912
4,446,936
4,446,961
4,446,994
4,447,149
4,447,224
4,447,284
4,447,504
4,447,528
4,447,544
4,447,545
4,447,590
4,447,594
4,447,607
4,447,636
4,447,676
4,447,747
4,447,752
4,447,770
4,447,779
4,447,816
4,447,852
4,447,854
4,447,870
4,447,877
4,447,879
26 : 4,446,573
4,446,592
4,446,596
4,446,608
4,446,644
4,446,697
4,446,719
4,446,724
4,446,759
4,446,809
4,446,821
4,446,825
4,446,830
4,446,837
4,446,842
4,446,906
4,446,949
4,446,951
4,446,955
4,446,971
4,446,996
4,447,018
4,447,024
4,447,031
4,447,047
4,447,072
4,447,073
4,447,077
4,447,094
4,447,188
4,447,192
4,447,237
4,447,277
4,447,383
4,447,390
4,447,449
4,447,451
4,447,499
4,447,503
4,447,620
4,447,640
4,447,650

4,447,656
4,447,664
4,447,698
4,447,738
4,447,775
4,447,808
4,447,860
27 : 4,446,593
4,446,617
4,446,626
4,446,652
4,446,660
4,446,767
4,446,795
4,446,796
4,446,807
4,447,015
4,447,481
4,447,493
4,447,521
4,447,588
4,447,693
4,447,781
4,447,836
4,447,842
4,447,844
4,447,872
29 : 4,446,667
4,446,679
4,446,760
4,446,848
4,447,039
4,447,081
4,447,378
4,447,414
4,447,606
4,447,618
4,447,785
30 : 4,447,537
31 : 4,446,639
4,446,664
4,446,775
4,446,851
4,446,926
32 : 4,447,281
33 : 4,446,616
4,446,847
4,447,168
4,447,681
4,447,896
34 : 4,446,603
4,446,621
4,446,625
4,446,629
4,446,638
4,446,666
4,446,705
4,446,762
4,446,805
4,446,852
4,446,858
4,446,865
4,446,960
4,446,995
4,447,003
4,447,109
4,447,124
4,447,125
4,447,127
4,447,164
4,447,205
4,447,221
4,447,267
4,447,310
4,447,312
4,447,314
4,447,332

4,447,335
4,447,338
4,447,363
4,447,365
4,447,381
4,447,387
4,447,421
4,447,426
4,447,443
4,447,447
4,447,482
4,447,512
4,447,533
4,447,551
4,447,571
4,447,602
4,447,603
4,447,629
4,447,632
4,447,634
4,447,642
4,447,666
4,447,675
4,447,744
4,447,760
4,447,822
4,447,826
4,447,843
4,447,883
4,447,905
35 : 4,446,721
4,446,988
4,447,151
4,447,153
4,447,303
4,447,761
36 : 4,446,574
4,446,583
4,446,606
4,446,628
4,446,636
4,446,647
4,446,651
4,446,725
4,446,776
4,446,841
4,446,856
4,446,910
4,446,943
4,446,945
4,446,965
4,446,982
4,446,986
4,447,000
4,447,043
4,447,048
4,447,095
4,447,100
4,447,103
4,447,110
4,447,111
4,447,134
4,447,141
4,447,145
4,447,212
4,447,223
4,447,232
4,447,245
4,447,266
4,447,354
4,447,386
4,447,442
4,447,459
4,447,466
4,447,494
4,447,511
4,447,523

4,447,541
4,447,562
4,447,569
4,447,572
4,447,575
4,447,630
4,447,655
4,447,700
4,447,715
4,447,746
4,447,764
4,447,799
4,447,813
4,447,817
4,447,824
4,447,830
4,447,848
4,447,864
4,447,868
4,447,899
37 : 4,447,709
38 : 4,447,089
4,447,633
39 : 4,446,645
4,446,696
4,446,742
4,446,768
4,446,777
4,446,780
4,446,813
4,446,849
4,446,941
4,446,948
4,446,958
4,446,964
4,447,002
4,447,016
4,447,032
4,447,099
4,447,140
4,447,197
4,447,248
4,447,249
4,447,294
4,447,348
4,447,373
4,447,380
4,447,385
4,447,409
4,447,457
4,447,458
4,447,461
4,447,462
4,447,464
4,447,465
4,447,468
4,447,478
4,447,566
4,447,585
4,447,595
4,447,616
4,447,643
4,447,667
4,447,765
4,447,780
4,447,782
4,447,807
4,447,861
4,447,862
4,447,865
40 : 4,446,634
4,446,886
4,446,919
4,446,991
4,447,246

4,447,342
4,447,401
4,447,418
4,447,554
4,447,555
4,447,597
41 : 4,446,600
4,446,601
4,446,844
4,446,868
4,446,999
4,447,299
4,447,803
4,447,847
4,447,876
42 : 4,446,716
4,446,786
4,446,860
4,446,863
4,446,867
4,446,883
4,446,920
4,447,011
4,447,022
4,447,036
4,447,093
4,447,106
4,447,117
4,447,121
4,447,175
4,447,195
4,447,204
4,447,311
4,447,313
4,447,347
4,447,388
4,447,397
4,447,402
4,447,404
4,447,405
4,447,496
4,447,508
4,447,509
4,447,557
4,447,560
4,447,570
4,447,611
4,447,621
4,447,638
4,447,639
4,447,654
4,447,658
4,447,670
4,447,680
4,447,690
4,447,703
4,447,748
4,447,758
4,447,767
4,447,795
4,447,796
4,447,797
4,447,798
4,447,845
4,447,906
45 : 4,446,690
4,446,691
4,446,764
4,447,241
4,447,269
4,447,346
47 : 4,446,797
4,447,243
4,447,377
4,447,577
4,447,617

4,447,624
4,447,646
48 : 4,446,575
4,446,678
4,446,694
4,446,713
4,446,730
4,446,745
4,446,748
4,446,806
4,446,874
4,446,884
4,446,887
4,446,917
4,446,918
4,446,929
4,446,935
4,447,038
4,447,060
4,447,097
4,447,104
4,447,157
4,447,213
4,447,230
4,447,274
4,447,291
4,447,296
4,447,382
4,447,393
4,447,413
4,447,474
4,447,668
4,447,754
4,447,849
4,447,858
4,447,867
4,447,875
4,447,881
4,447,888
49 : 4,447,356
4,447,399
50 : 4,446,611
4,446,658
4,446,729
4,447,152
4,447,857
51 : 4,446,714
4,447,056
4,447,061
4,447,078
4,447,172
4,447,272
4,447,297
4,447,325
4,447,361
4,447,539
4,447,750
4,447,771
4,447,792
53 : 4,446,869
4,447,026
4,447,027
4,447,028
4,447,083
4,447,118
4,447,286
54 : 4,447,648
55 : 4,446,743
4,446,850
4,446,898
4,446,913
4,446,915
4,447,251
4,447,339
4,447,483
4,447,536

DESIGN PATENTS

04 : 273,757
06 : 273,721
273,729
273,735
273,739
273,741
273,744
273,792
273,793
273,796

08 : 273,790
273,791
09 : 273,810
11 : 273,811
13 : 273,768
17 : 273,767
273,779
273,807
273,813
18 : 273,746

273,806
19 : 273,756
273,778
24 : 273,742
273,774
273,808
25 : 273,788
26 : 273,776
273,781
27 : 273,798

34 : 273,724
273,800
35 : 273,786
36 : 273,728
273,730
273,733
273,736
273,737
273,740

273,782
273,787
273,794
37 : 273,769
273,797
39 : 273,734
273,758
273,775
40 : 273,720

41 : 273,783
42 : 273,725
273,738
273,789
47 : 273,732
48 : 273,726
273,755
273,799
55 : 273,802

PLANT PATENTS

06 : 5,228

12 : 5,230

39 : 5,229

U.S. GOVERNMENT PRINTING OFFICE : O—1984

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ Domestic; @ $ Foreign.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402